

# *Machine and Tool* **BLUE BOOK**

ESTABLISHED 1906

**JUNE 1951**

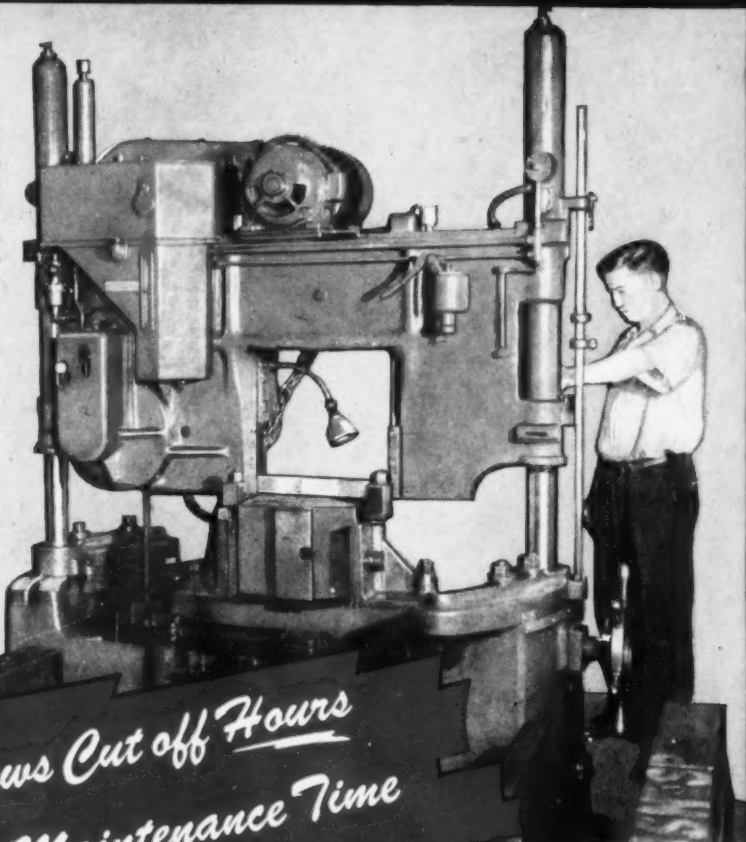
How to solve your tapping problems

Increasing life of hydraulic mechanisms

Grinding costs reduced with atomized spray grinding

Contents on Page 5

Below (left) is a model 9A MARVEL High Speed Production Saw with automatic bar push-up, which automatically cuts off billets to exact size (ends fin waste), and, a No. 18 MARVEL Giant Hydraulic Hack Saw for cutting off large bars and billets and trimming dies in sizes up to 18" x 18" cross section.

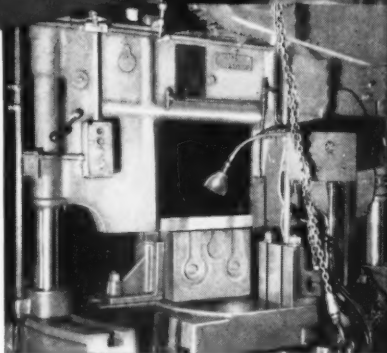


*Marvel Saws Cut off Hours  
from Die Maintenance Time*

Hubbard & Company, Pittsburgh, manufacturers of pole line hardware, picks, hammers and other drop forged specialties, use MARVEL Saws to eliminate tedious hours in making and maintaining their giant forging dies. Not only do these saws do all regular cutting-off of steel for the machine shop, die blocks for die shop and exact size billets for the forge shop, they also materially cut the cost of die maintenance.

Previously, it was necessary to plane the face of dies being re-worked. This was a long and tedious job because the die face is always work-hardened with hard spots that had to be chipped or ground out before the planer tool could make a cut. Now with MARVEL Saws, the face of a die is speedily and accurately "skinned" — a thin slice is sawed off just behind the hard spots. After this speedy "skinning" and a single facing cut on the planer, the die is ready for the die sinker. This modern MARVEL method is saving Hubbard a lot of dies, materials, labor and machine time.

For quick reference see our section in Sweet's File—Mechanical Industries or write for catalogue.



**ARMSTRONG-BLUM MFG. CO.**

"The Hack Saw People"

**5700 Bloomingdale Ave.**

**Chicago 30, U.S.A.**



**New • Fast • Proven**

# LOW COST

## **methods for PERFORATING and NOTCHING SHEET METALS**

### **Whistler MAGNETIC Dies**

at work in large inclinable press. Magnetized units hold the retainers. No bolting required. A fast, economical method in making up a punch and die set for short or long runs. All parts re-usable.

### **Whistler ADJUSTABLE Dies**

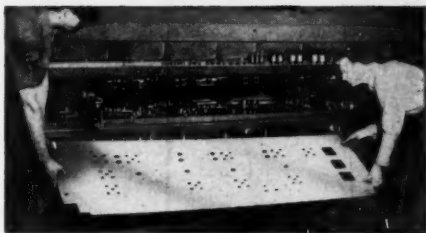
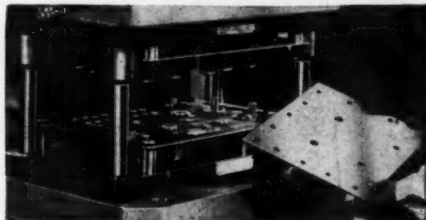
on  $\frac{1}{8}$ " steel perforating and notching job, using Tee slotted die set. With Whistler Punch and Die units production starts within hours instead of weeks. Last minute job changes made quickly.

Here are the complete details with prices and application illustrations. Send for these catalogs. No obligation.



Both methods feature: **LOW DIE COSTS**

All units and parts are interchangeable and used repeatedly in different arrangements. **INCREASE PRESS PRODUCTION**—Down time is minutes as compared to hours for change-over. For precision work in all types and sizes of presses. **START PRODUCTION at once.** Pierce up to  $\frac{1}{4}$ " thick mild steel. Saving money in the best known plants.



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CITY \_\_\_\_\_

ZONE \_\_\_\_\_

STATE \_\_\_\_\_

## **S. B. WHISTLER & SONS, Inc.**

*Adjustable, Magnetic, Custom and Cam Dies for all Industry*

**760 Military Road**

**Buffalo 23, New York**

# Wade®

No. 7

## HAND SCREW MACHINE

**HOLD CLOSE PRECISION TOLERANCES!**

The case hardened tool blocks are cut away, so you can get closer to the spindle than with any other type of tool block.

7" swing Spindle speeds, 315 to 3300 RPM  
1" collet with superior characteristics  
4-to-1 Hi-Low Speeds at finger tips  
Spindle stops without stopping motor



*Send for Catalog*

**THE WADE TOOL CO., 51 River St., Waltham, Mass.**

**HARDINGE**  
ELMIRA, N.Y.

# Style "S"

**SURE-GRIP Master Collets  
and Pads**



Multiple spindle automatics equipped with Hardinge Master Collets and Pads give solid collet performance—at low cost. Pads are interchangeable among different machines with same capacity. Available for all sizes of the following machines up to and including 3 1/2" capacity:

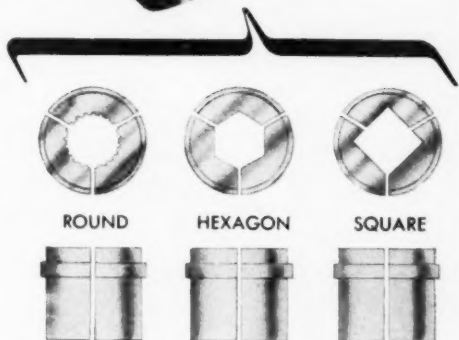
CLEVELAND  
CONE

GREENLEE

GRIDLEY and ACME-GRIDLEY

NATIONAL ACME

NEW BRITAIN



Ask for Style "S" and Style "B" Bulletins  
which give all performance features,  
price savings, and ordering information.

**HARDINGE**  
ELMIRA, N.Y.

# ARMSTRONG

## TOOL HOLDERS . . .

### for every operation!

There are ARMSTRONG TOOL HOLDERS in sizes and types for every operation on lathes, planers, slotters and shapers—for the heaviest cuts; for the most delicate cuts.

With Standard shaped cutters, bits and blades of ARMSTRONG HIGH SPEED, ARMALLOY (Cast Alloy) and ARMIDE (Carbide-Tipped) they provide a system of tooling that assures maximum production per machine hour, lower tool costs, and higher machining profits.

These permanent multi-purpose tools can be picked up as needed from your industrial distributor. Use them wherever possible to increase number of pieces per hour, to lower cost per piece.

*Write for Catalog.*

**ARMSTRONG BROS. TOOL CO.**

*"The Tool Holder People"*

5208 West Armstrong Ave., Chicago 30, Illinois



MACHINE and  
**MTBB**  
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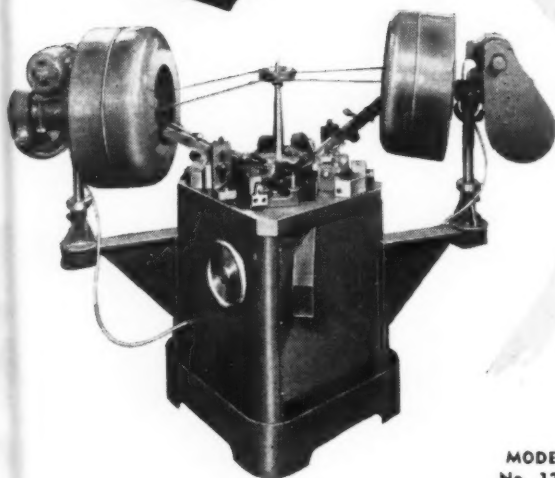
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FOR SPEEDIER  
THREAD ROLLING  
TRY THE

ROLLMASTER



MODEL  
No. 125

### PLANETARY THREAD ROLLING MACHINE

PRODUCTION	25,000 Threaded parts per hour
TOLERANCE	Class 3
DIE LIFE	3 to 5 MILLION pieces per set
CAPACITY	$\frac{1}{4}$ "x2" Threads.

*\*Also available for threading letter ring and spiral nails, stud bolts and many knurling, marking, serrating, necking and contour operations*

INFORMATION available on this machine and on the #200 ROLL-MASTER Planetary Thread Rolling Machine for threads  $\frac{1}{2}$ "x3"

# D. H. PRUTTON

Machinery Co.

5295 W. 130th ST.

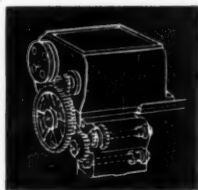
CLEVELAND 11, OHIO



# quick change artist

Reposition just 3 parts

Set up only two additional gears



**from English to metric thread-chasing\* in about  
ten minutes**



Simple straightforward steps arrange your Tray-Top light duty engine lathe to cut a full range of 48 metric threads and carriage feeds through the standard quick change box . . . quicker by far than for any other lathe, and more economical, too . . . What's more, you can change any of 12 spindle speeds (all geared, 40 to 1 overall ratio) in an instant, with 3-lever direct-reading color-match speed selector . . . And you can change setups because parking spaces on top of headstock and tailstock put mikes, tools, etc., at operator's fingertips, right where needed.

**\*required for  
many defense items.**

Your Tray-Tops are indeed quick change artists. Operators spend no time figuring, more time getting work out. Make your next light duty lathe a Tray-Top.

**cincinnati lathe & tool co.** CINCINNATI 9, OHIO, U.S.A.

# SWITCH-HITTER

on the  
cincinnati die sinking team

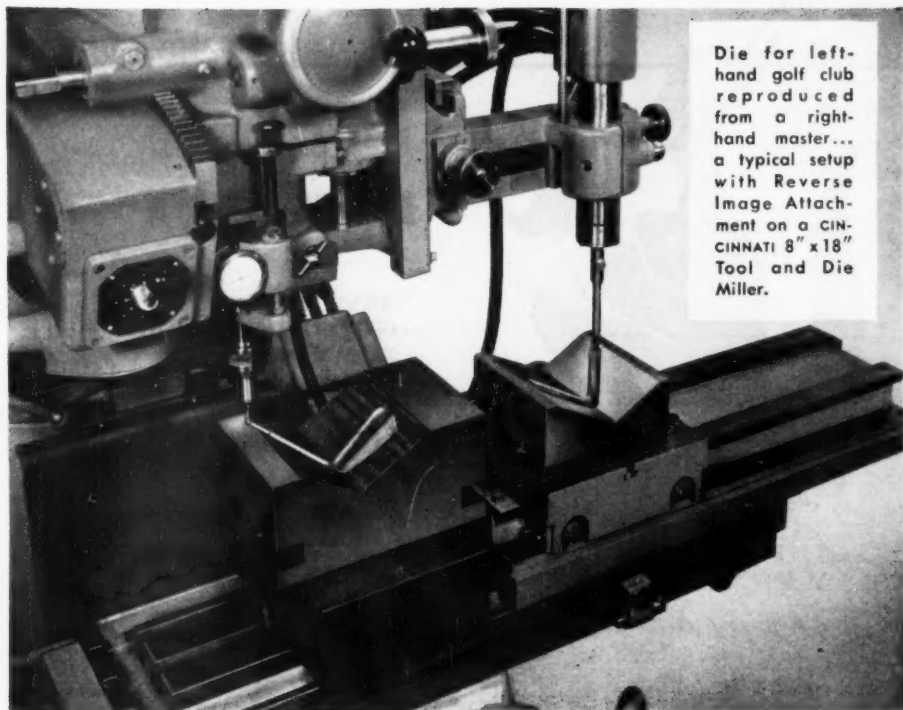
Left-hand dies and molds made from right-hand masters, and vice versa! That's the cost-reducing advantage offered by Reverse Image Attachments for CINCINNATI Hydro-Tel Type Milling Machines. Every minute detail in the master is reproduced in the work under the cutter, but to the opposite "hand." There is a size for the 8" x 18" Tool and Die Miller, 16" Vertical Hydro-Tel and 28" Vertical Hydro-Tel. If you have these CINCINNATI Milling Machines in your shop working on die sinking operations, it will pay you to look into the possibilities of Cincinnati Reverse Image Attachments.

THE CINCINNATI MILLING MACHINE CO.  
CINCINNATI 9, OHIO



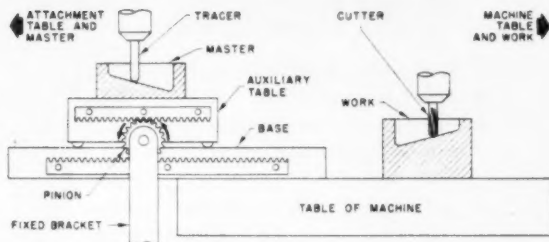
## CINCINNATI

MILLING MACHINES • CUTTER SHARPENING MACHINES  
BROACHING MACHINES • FLAME HARDENING MACHINES  
OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID



Die for left-hand golf club reproduced from a right-hand master... a typical setup with Reverse Image Attachment on a CINCINNATI 8" x 18" Tool and Die Miller.

Principle of operation, Reverse Image Attachment for CINCINNATI Hydro-Tel Type Milling Machines. The drawing is a view from the rear, showing the racks and gear to advantage.



Reverse Image Attachment for CINCINNATI 28" Vertical Hydro-Tel Milling Machine.

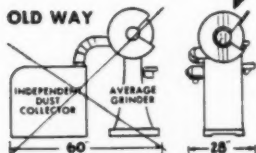


Reverse Image Attachment for CINCINNATI 16" Vertical Hydro-Tel Milling Machine.



## "BUILT-IN" FEATURE

SAVE OVER 50%  
FLOOR SPACE THE  
HAMMOND WAY



*Hammond*  
of KALAMAZOO

### NO-DUST GRINDER

- Requires only 6½ square feet.
- Protects employees' health.
- Protects nearby machine tools against excessive wear from dust and grit.

A self-contained Grinder and Dust Collector for 10", 12" and 14" wheels. Write for Bulletin No. 104.

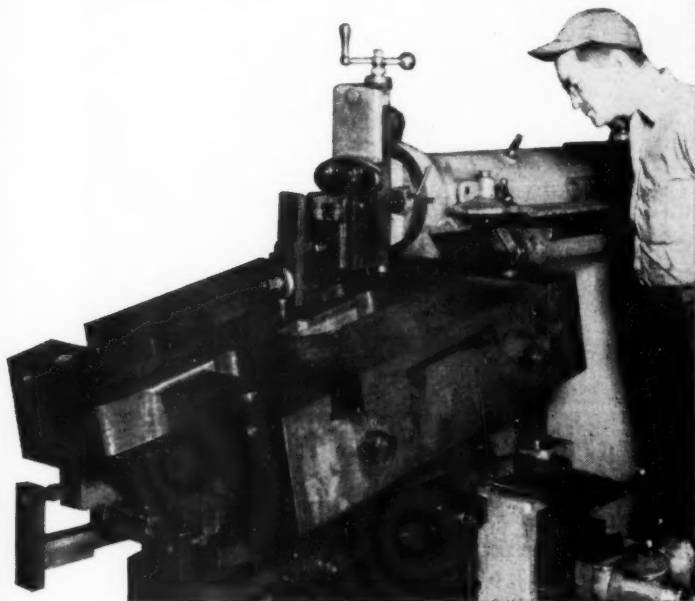


*Hammond*  
*Machinery Builders*  
INC.

1614 DOUGLAS AVENUE

KALAMAZOO 54, MICHIGAN

# Cincinnati Shapers are versatile money savers...

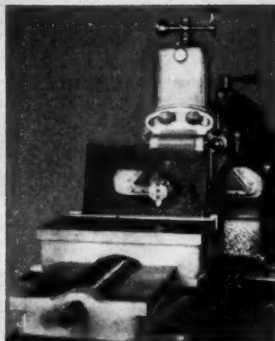


Eight to ten hours' work cut to fifteen minutes in this unusual application of a versatile Cincinnati Shaper.

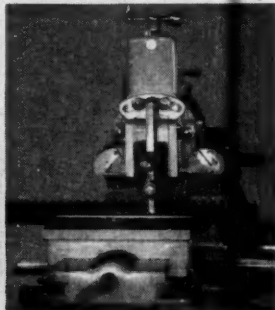
Hand scraping the mating surfaces of press bed bolsters required eight to ten hours. On this Cincinnati Shaper the lapping operation replacing the hand scraping method takes only fifteen minutes.

Versatile Cincinnati Shapers, with low tooling and set-up costs, bring to your shop a money-saving "handy man."

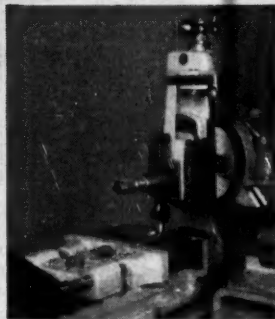
Write for Catalog N-S, illustrating the complete line of powerful, accurate and versatile Cincinnati Shapers. You will find just the size and type for your shop.



- 1. Internal Shaping**  
Many irregular shapes are cut with a simple extension tool.



- 2. Maintenance and Repair**  
The unusual versatility of a shaper is invaluable for this work.



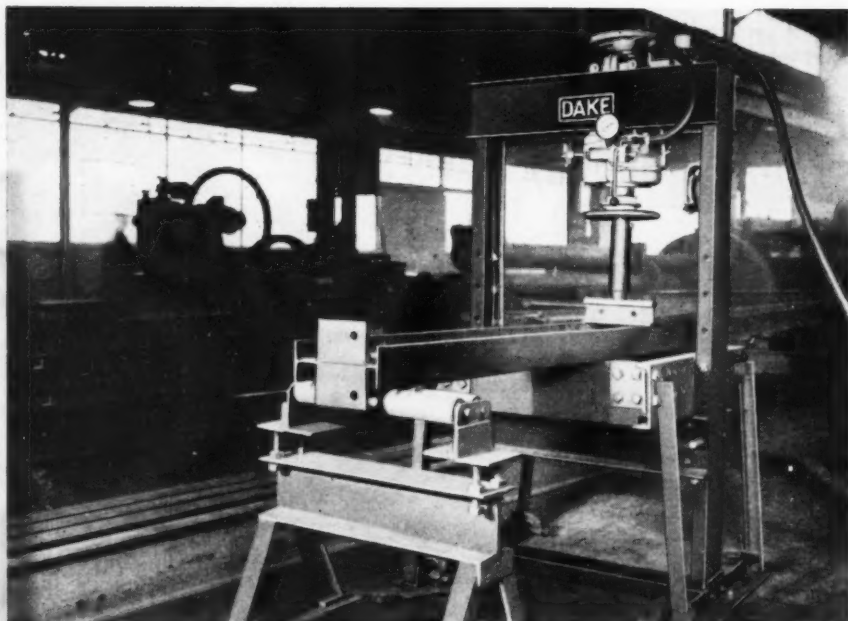
- 3. Contouring**  
A great variety of shapes are automatically machined with tracer control.



## THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO U.S.A.

SHAPERS · SHEARS · BRAKES



# *Straightening Time Cut 66%*

## **by Using a Standard Model Dake Press**

When a steel fabricating company recently sought a faster way to straighten welded I-beams and channels, first reports indicated that special equipment would have to be built for the job.

Dake engineers advised otherwise: "By equipping our standard 50-ton air-operated press with a special table and screw nose," they said, "straightening costs should be reduced materially on all your structural work."

The company bought the press and

adapted it to the job. As a result... straightening time was reduced 66%, and the press paid for itself in the first two months of use.

If you have any kind of straightening, bending, or pressing jobs, consider a regular Dake Press first. Dake engineers will advise if your situation requires custom-engineered equipment.

The complete line of standard model Dake Presses is illustrated and described in a folder which we will gladly send you. Write for it, today.

Dake Engine Company, 608 Seventh St., Grand Haven, Michigan





*Make your*  
**TOUGH**  
**JOBS**  
*Easier*  
 with  
*Jarvis*  
**FLEXIBLE SHAFT MACHINES**



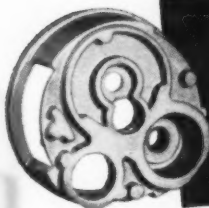

Dependable Jarvis Flexible Shaft Machines make your *tough* jobs easier — do them faster and more economically. Made to meet your individual requirements for grinding, cutting, buffing and many other operations, Jarvis Flexible Shaft Machines are available in bench, floor or overhead types — single or multiple speeds. Factory trained Jarvis representatives are ready to help you select the machines best suited to your own applications.

Long-lived Jarvis Rotary Files, depended upon the world over, are available in many shapes and flutings. For detailed information on Jarvis Flexible Shaft Machines and Rotary Files, write to The Charles L. Jarvis Company, Middletown, Conn.

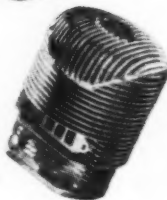
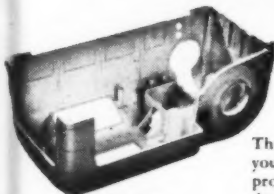


TAPPING ATTACHMENTS • TECNI-TAPS and DIES • ROTARY FILES  
 FLEXIBLE SHAFTS and MACHINES • QUICK CHANGE CHUCKS and COLLETS

THE CHARLES L. JARVIS CO., MIDDLETOWN IN CONNECTICUT



producing **BIG** ones?  
or small ones?  
using various types of alloys?



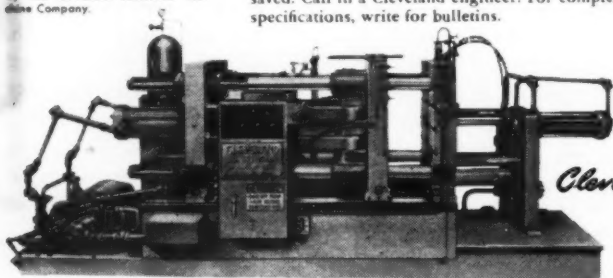
Cleveland Model 400 High-Pressure Hydraulic Die Casting Machine. 36" x 36" die plates, 400 tons locking pressure. Die casting machines of smaller capacities are also produced by The Cleveland Automatic Machine Company.

all your requirements for profitable die casting can be met with the Model 400 **CLEVELAND** Die Casting Machine

The Model 400 Cleveland Die Casting Machine will give you precision quality castings at a highly profitable rate of production. Castings may range in size from tiny parts produced in multiple cavity dies, to single castings weighing as much as 16.1 lbs. in zinc, or 7.5 lbs. in aluminum. Universal in design, the Model 400 can be quickly converted from zinc, tin or lead casting to aluminum, magnesium or brass casting, by changing the hot metal end.

Cleveland design gives you easy access to dies; ample die area; sure-fire shot mechanism; rapid, positive core pull and ejection; safe and simple control—either manual or automatic. Heavy, rigid construction and massive toggle linkage lock dies with tremendous pressure. Cleveland's high injection speed and pressure produce sound, dense, *hardware finish* castings. Dimensions are held to close tolerances; cored sections are precision-cast.

The nation's leading producers of die castings rely on Cleveland dependable performance—for around-the-clock production! You should find out now how Cleveland machines can improve *your* die casting production with money saved. Call in a Cleveland engineer. For complete machine specifications, write for bulletins.



Remember

*Clevelands Cut Costs*

**THE CLEVELAND AUTOMATIC MACHINE COMPANY**

4934 Beech Street  
Cincinnati 12, Ohio

SALES OFFICES: CHICAGO  
CLEVELAND • DETROIT  
HARTFORD • NEWARK

Manufacturers of a Complete Line of Single Spindle Automatic Screw Machines and High Pressure Hydraulic Die Casting Machines

The extensions illustrated are typical of the complete Apex line. Made from high carbon, electric furnace alloy steel, Apex extensions are offered in a full range of lengths, available in 1-inch increments.



## **APEX** Extensions *are fitted to the JOB!*

• Fit the tool to the job—use Apex extensions to increase output per tool and to lower tool costs. Precision-machined to closer tolerance—as low as .002"—Apex extensions are concentric; provide positive, accurate fits on sockets and air guns . . . that means less vibration and backlash, the causes of loss of torque.

Offering any combination of female and male square, Apex can always provide direct drive from gun to work, eliminating quick-change chucks and increasing torque. Apex extensions are designed to do a better job, for a longer period of service. Catalog 19 lists the full line of Apex extensions, sockets and adapters. Write, on your company letterhead please, for your copy.

# **APEX**

## sockets, extensions, adapters

**THE APEX MACHINE & TOOL COMPANY**

1028 S. Patterson Blvd. • Dayton 2, Ohio

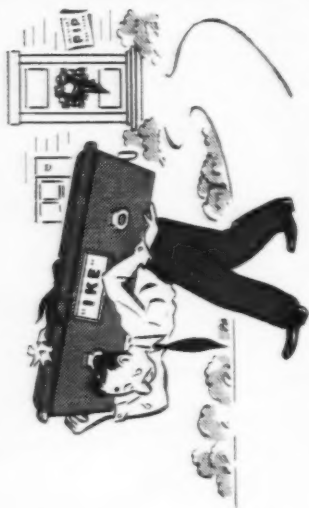
Safety Friction Tapping Chucks • Vertical Float Tapping Chucks • Self-Releasing and Adjustable Stud Setters • Power Bits for Phillips, Frearson, Slotted Head, Clutch head, Hex Head and Socket Screws • Hand Drivers for Phillips, Frearson and Clutch Head Screws • Aircraft and Industrial Universal Joints • Sockets and Universal Joint Socket Wrenches.



There were two gents who looked the same,  
Yet each one had a different name.



Just like two taps that look akin,  
It's the way they're made that helps you win.

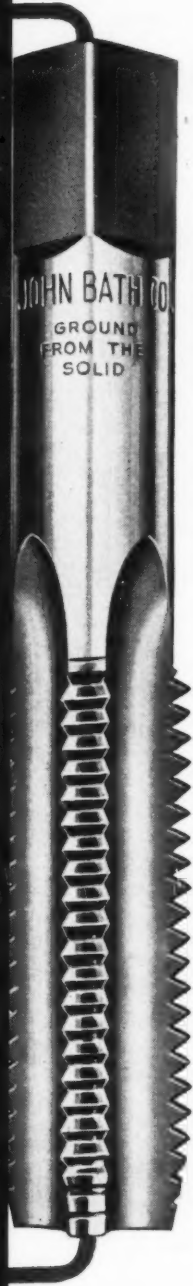


Long life depends on how you're made.  
Both had the "pip"—one died—one stayed!



When the name is Bath, you can't go wrong,  
Since **ALL** Bath Taps have a life that's long.





## INSIST ON BATH TAPS . . . PROFIT BY THEIR PLUS-PERFORMANCE

There are many reasons for the long life of Bath Taps, starting with the careful selection, heat treating and hardening of the basic steel.

Of great importance is the engineering "know how" in the design of the tap to meet its particular requirements; the accurate grinding from the solid while the tap is

mounted on center holes; the excellent condition of special machinery used in tap manufacture at the Bath plant.

Right now . . . you need high quality Bath Taps for better performance. Why not ask the Bath representative to investigate any threading problems that are holding up your production . . . or, write us direct.

PLUG AND RING THREAD GAGES • GROUND THREAD TAPS • INTERNAL MICROMETERS

**JOHN BATH CO.** INCORPORATED  
14 Grafton St., Worcester, Mass.



There were two gents who looked the same,  
Yet each one had a different name.



Just like two taps that look akin,  
It's the way they're made that helps you win.

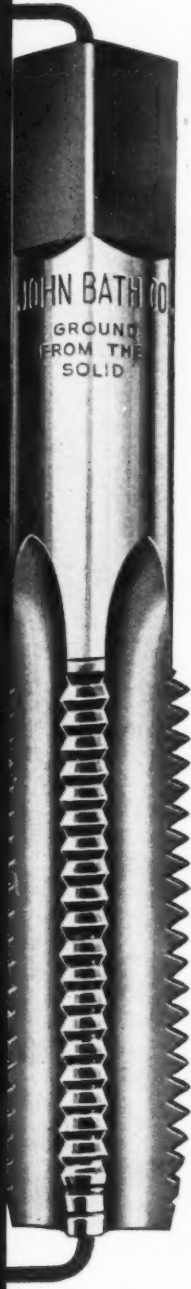


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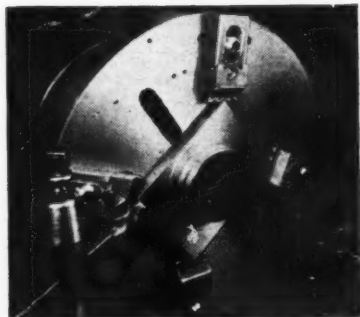
PLUG AND RING THREAD GAGES • GROUND THREAD TAPS • INTERNAL MICROMETERS

**JOHN BATH CO.** INCORPORATED  
14 Grafton St., Worcester, Mass.

# PRODUCTION RATES CLIMB with NEW J & S JAW CLAMPS

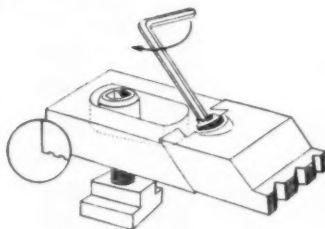
## J & S "All-Purpose" JAW CLAMPS

**Eliminate U-Clamps, Straps  
& Fingers — also, in most  
cases, eliminate 4-jaw chuck,  
vises and special fixtures!  
For lathes, planers, milling  
machines & drill presses.**



Typical lathe application. Work-piece removed by simply loosening one screw in each of two adjoining clamps. No RE-POSITIONING NECESSARY for next piece.

Fastest, simplest — work-pieces held rigidly. Less obstruction, no slipping, because a  $1/16''$  tapered slot insures firm grip. Also, angle of jaw travel is  $45^\circ$  to plane of the face plate or table. As the screw is tightened, the jaw forces the work-piece down against the machine surface — across against the opposite clamp — this grip is stronger than that provided by eight U-clamps!



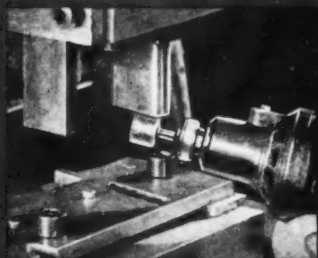
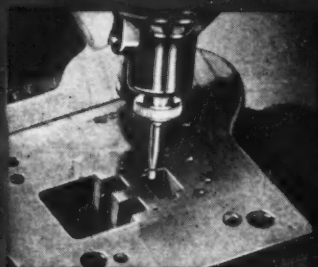
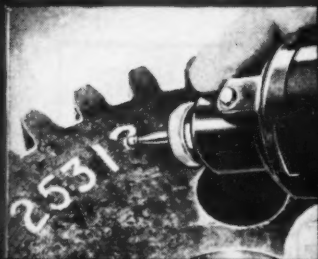
Tested for two-ton down pressure, completely hardened.

As the drawing shows, jaws of the standard J & S Clamp are only  $23/64''$  thick — allows overall machining to within  $3/8''$  of the machine's working surface! Available in types and sizes to suit all applications. "T" nuts furnished to fit all standard machines.

### WRITE FOR NEW FOLDER!

—Contains complete details on advantages, applications, types and sizes available. "Time Saver" booklets, describing J & S "Fluidmotion" Wheel Dressers, etc., also on request.

**J & S TOOL CO., INC.**  
471 Main Street, East Orange, N. J.  
Representatives in Principal Cities



**PAYS FOR ITSELF ON  
"HARD-TO-GET-AT" JOBS**

# DREMEL

## Electric MOTO- TOOL



**Approximately  
27,000 R.P.M.**

Dremel Moto-Tools are time-tested — have been widely used in industry for over fifteen years. A veteran of World War II, Moto-Tool served in war plants and at military maintenance bases throughout the world. Thousands of these mighty midgets helped to make the atomic bomb — were used to establish production records in defense industries during the last war. Hundreds of toolroom and production line operations, such as polishing and grinding dies, burring parts, marking tools, sharpening cutters, touch up jobs, etc. are accomplished in seconds, **without tearing down "set-ups."** Moto-Tool is sturdily constructed for long lasting industrial service. Weighs only 13 oz. — dynamically balanced for vibration-less operation.

**MOTO-TOOL KIT NO. 2** contains 23 accessories, including **high-speed steel cutters** and Model 2 Moto-Tool in natural finish hardwood case ... **\$23.50**

**MOTO-TOOL No. 2**, with one emery wheel point ..... **\$16.50**

Dremel **HIGH-SPEED STEEL CUTTERS** and balanced wheel points are available for all makes of hand grinding tools. Write for literature.

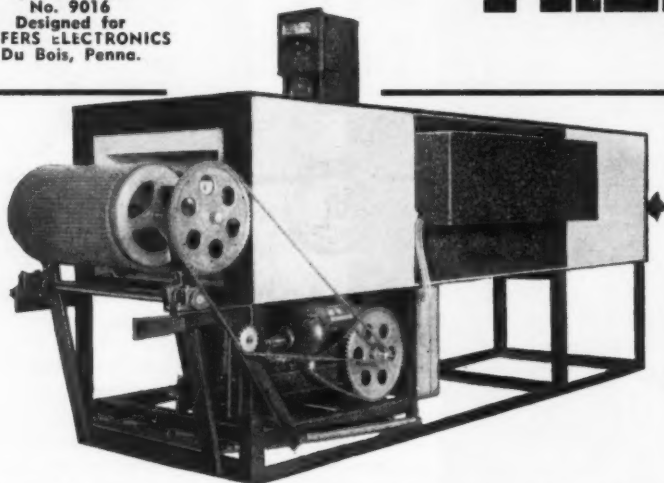
**WRITE FOR INDUSTRIAL CATALOG**



**DREMEL MFG. CO. Dept. 211-F RACINE, WIS. U.S.A.**

# TRY A LUCIFER ELECTRIC FURNACE **FREE**

Special Model  
No. 9016  
Designed for  
JEFFERS ELECTRONICS  
Du Bois, Penna.



## SIMONSKI DESIGNED LUCIFER FURNACES NOW AVAILABLE IN CONVEYOR MODELS

At last—a reliable electric furnace with dependable conveyor system for production "runs". Blue Chip companies using Lucifer report satisfactory performance in regular hardening, case hardening, drawing, tempering and ceramic baking. Available in ready-made sizes, also custom built. New electronic controls permit Lucifer Furnaces to attain desired heat slowly or rapidly as needed. Cooling time also controlled.

### TRY LUCIFER AT OUR RISK

Describe your operation to us on your letterhead. Outline any special heat treating problems you've encountered. Tell us the size and type furnace you require. We'll send you specifications and operating instructions via air mail. Your Lucifer Electric Furnace will then be shipped you AT OUR RISK. No results—no pay. We make this offer in good faith for no trial user has ever wanted to return his Lucifer Furnace! Write us on company letterhead TODAY.

### FREE ENGINEERING SERVICE

Our talented design and engineering people can help you on special purpose furnaces. We've made them for America's "Blue Chip" companies, the Armed services, etc. Our company owned NAVION plane, "The Lucifer" is at disposal of our engineering department for quick flights to plants anywhere in United States. Heat treating headaches vanish when you entrust your problems to . . .

**GILBERT S. SIMONSKI CO.**  
Precision Machine & Tool Work  
401 N. BROAD ST. PHILA. 8, PA.  
Sole Manufacturers  
**LUCIFER ELECTRIC  
FURNACES**

USE

# *Palmer-Shile* AIR SAVER *Leak Proof* AIR VALVE

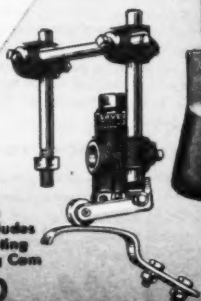
TO  
*Get Split-second Air Control!*

## FOR MAXIMUM MACHINE TOOL EFFICIENCY

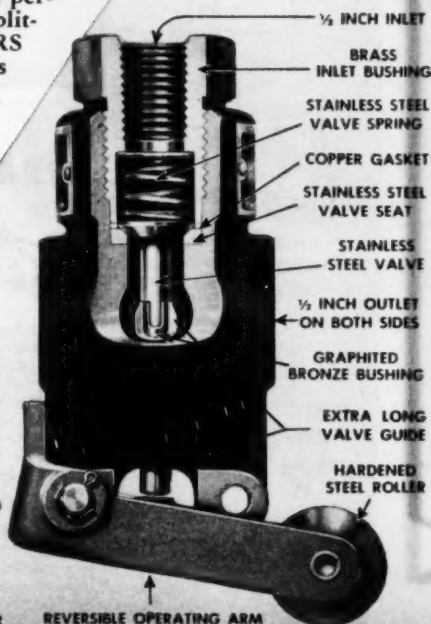
PALMER-SHILE *Air Saver* air valves give you perfect, leak-proof air power control every split-second of machine tool operation. AIR SAVERS are ideally suited to applications where air is used for cleaning, drying, cooling, positioning or ejecting. AIR SAVERS are recommended around punch presses, die casting machinery, drill presses, in reaming, broaching and many other operations. AIR SAVERS may always be depended upon to provide ample air volume for operation of single or multiple jets. AIR SAVERS may be mounted in any position, to operate at any angle unaffected by vibration. MANUFACTURERS AND OPERATORS: for split-second air control and maximum machine tool efficiency, build Air Saver air valves into your new machines. Or install Air Savers in machines you now have in operation.

**Immediate  
Delivery**

**50801**  
Complete  
Assembly includes  
Valve, Mounting  
Rod, Operating Cam  
**\$16.50**

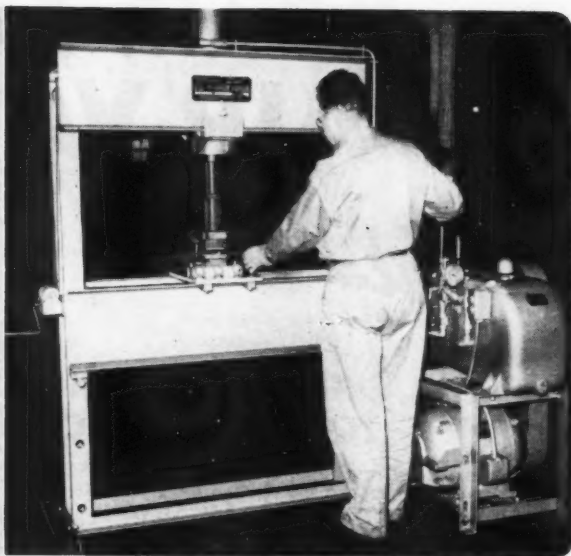


**50975**  
(Valve Alone)  
**\$13.20**



# *Palmer-Shile Co.*

16021 FULLERTON AVE. • DETROIT 27, MICH.



Above is a standard Rodgers 60 ton Shop Press with a Rodgers Power Pump.  
Other models have capacities of 80, 100, 150, 200, 300 and 400 tons.

## HERE'S *Rodgers Hydraulic* POWER ...to do 101 jobs faster, better, easier

You'll find a Rodgers Shop Press is the finest all-around time-and-labor-saving equipment you can have in your plant... for a multitude of pressing, forming, bending, straightening jobs... for die tryout... and even short production runs.

Their many exclusive features make Rodgers Shop Presses unusually versatile in performance... and there are several standard models and capacities to suit most every shop or plant requirement.

Other Rodgers Hydraulic Equipment is available too, for your special jobs.

### SEND FOR CATALOGS

Complete details of Rodgers Equipment are covered in available catalogs. Write for them.



# Rodgers Hydraulic, Inc.

7453 Walker St., St. Louis Park, Minneapolis 16, Minn.

**HYDRAULIC POWER EQUIPMENT**





*High  
quality  
of*

# PRODUCTO

## DIE SET

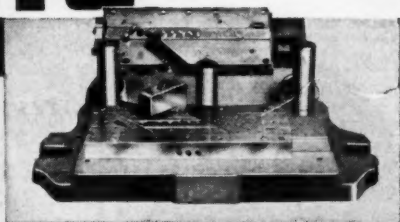
**PERMITS CLOSE TOLERANCE  
PROGRESSIVE DIE JOB**

This tiny (.502" overall) electrical connector for a miniature radio tube was stamped and curled to form a wire gripping tube from a copper strip 1" wide, .010" thick. The 16 station progressive die\* was mounted on a Producto Die Set, so highly accurate that die sections were profile ground to  $\pm .0003$ " and

punches made to fit with clearance of .0002" between punch and die. Only the precision quality of this Producto Die Set allows such close tolerance work.

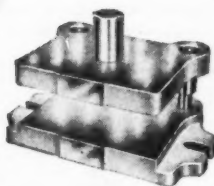
Call "Producto" in Classified Telephone Directory for Catalog or Special Die Sets... fast delivery... highest quality.

\* Die designed and made by Globe Tool & Gauge Works, Boston, for National Co., Inc., Malden, Mass.



### OPERATIONS CHART

1. Notch (for guide)
2. Pierce hole
3. Pierce to shape
4. Pierce to shape
5. Idle
6. Pierce for tube
7. Idle
8. Preform fingers
9. Form tube
10. Form tube
11. Precurl, started
12. Precurl, continued
13. Idle
14. Curl completed (45° angle plunger)
15. Idle
16. Blank out



**THE PRODUCTO MACHINE COMPANY**  
960 HOUSATONIC AVE., BRIDGEPORT 1, CONN.

# NEW

MODELS—FEATURES

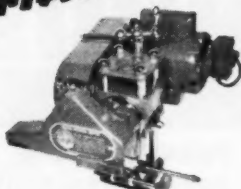
## MASTER MILLING ATTACHMENTS

FOR PRODUCTION—TOOL ROOM—EXPERIMENTAL  
AND MAINTENANCE SHOPS

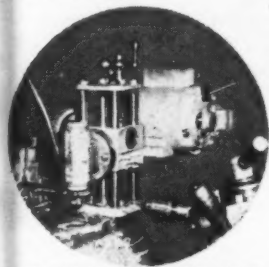


MILLING ON LATHE—Model "M" 1½ h. p. milling ½" keyway one foot per minute.

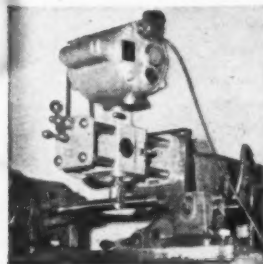
## LATHES TURRETS AND MILLING MACHINES



*Master Universal  
Slotting and Keyseating Head*



MILLING ON TURRET—Model "B" with 90° milling head mounted on rear cross-slide for keyways, slots, cross milling—completing part in turret.



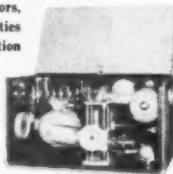
ON MILL—One or two milling heads can be used on post assembly for single or multiple milling cuts. Mounts on overarm for vertical milling or cross-ways for opposed milling head.

### 3 SIZES • CAPACITIES

- Model "C"—½ h. p. motor—9" to 13" swing lathes
- Model "B"—½ or ¾ h. p. motor—14" to 18" swing lathes
- Model "M"—1 or 1½ h. p. motor—18" to 72" swing lathes

The Master Lathe Converter is a precision multi-purpose machine tool attachment adaptable on most all basic shop machines. The basic unit does milling, drilling, boring, and has eight interchangeable heads for milling, drilling, grinding, slotting, keyseating, and indexing. Spindle speeds, 50 to 15,000 rpm. It provides complete machining facilities with minimum equipment investment, produces more operations per set-up thus increasing production of your present equipment, saves work transfer, assures accuracy, is simple and fast to set up. Prime and subcontractors are converting their present equipment for special applications and production with the multi-purpose Master Lathe Converter.

**COMPLETE SHOP KIT**—This group of equipment includes basic milling unit, external and internal grinding heads, 90° universal and hi-speed milling heads, slotting or internal keyseating head, 40 to 1 geared dividing head, seven arbors, in a heavy plywood shop cabinet. This kit provides facilities for most all machine shop operations on a lathe at a fraction of the investment required for individual machines, plus wide use on other basic shop machines. Ideal for maintenance and repair, tool room, experimental, mobile units, aboard ships, and production shops.



- ★ MILLING ★ DRILLING ★ BORING
- ★ THREAD MILLING ★ GRINDING
- ★ SLOTTING ★ INDEXING
- ★ INTERNAL KEYSEATING

WRITE FOR FREE LITERATURE

**MASTER MANUFACTURING CO.**

1310 EAST AVENUE A  
HUTCHINSON, KANSAS, U. S. A.

# every DRILL PRESS needs one...

- speed drilling production  
- improve drilling quality  
- prevent drilling accidents

## Float-Lock

PATENTED

## Safety VISE

- FULL FLOATING VISE
- PREVENTS DAMAGE TO DRILL
- FITS ALL DRILL PRESSES
- A DEPENDABLE DRILL JIG
- ELIMINATES ACCIDENTS
- FOR ALL SET-UPS
- IDEAL FOR ANGLE DRILLING

Now you can drill faster and better with fewer accidents on any drill press. You save time and money by eliminating the need for costly, hard-to-set-up jigs and fixtures. Installing Float Lock Safety Vises on every drill press in your shop will increase the capacity of your existing equipment!

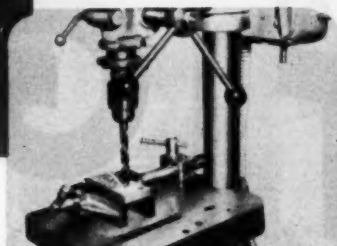
**See your nearest  
mill supply dealer!**

Manufactured Exclusively by

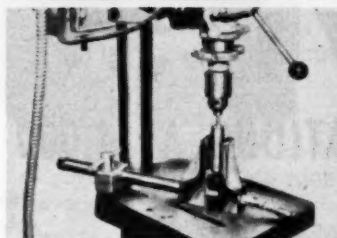
## Float-LOCK CORPORATION

224 GLENWOOD AVENUE  
BLOOMFIELD, NEW JERSEY

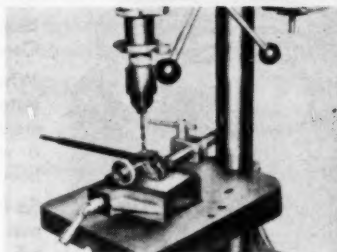
DESIGNERS AND BUILDERS OF SPECIAL TOOLS



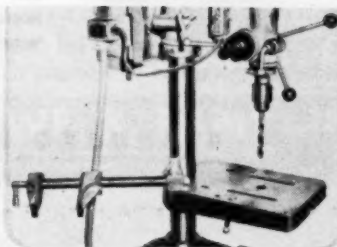
For regular drilling, Float-Lock secures the work positively, locks securely in seconds. Eliminates accidents and damaged drills.



Float-Lock can be positioned in seconds to accommodate work for end drilling or centering. Swings out of the way when not in use.



Float-Lock holds fixtures securely. Duplicate pieces are automatically precision positioned for drilling.



Float-Lock leaves table clear when not in use. Swings back instantly when needed.



**SELF-LOCKING NUTS**

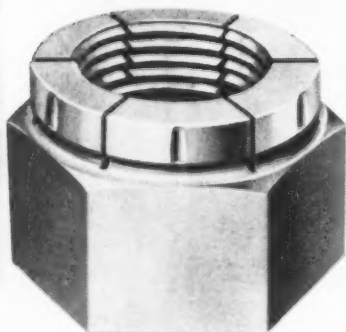
**STAY**

**TIGHT**

**AFTER**

**171,360,000**

**VIBRATIONS AT 4,000 CYCLES PER MINUTE**



Plain nuts with lock washers loosened after only ONE HOUR of 4000-cycle-per-minute operation on the vibrator of a concrete block machine at the plant of the Bethayres Concrete Block Co., Bethayres, Pa.

When FLEXLOC Self-Locking Nuts were installed, they were still tight when the machine was torn down for rebuilding after 6 weeks operation—at 4000 C.P.M., 17 hours a day, 7 days a week!

So if you have an application where plain nuts might or actually do loosen and back off, try FLEXLOC, the one-piece, all-metal STOP- and LOCK-NUT "that won't work loose."

*Send for Bulletin 619-A today.*

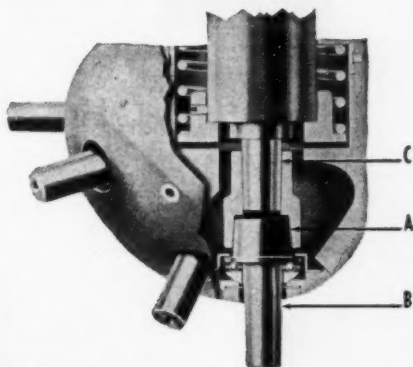
**SPS**

**STANDARD PRESSED STEEL CO.**

**JENKINTOWN 52, PENNSYLVANIA**

# MORE HOLES PER HOUR — PER DOLLAR

Increase production of any standard drilling machine by adding a Lign-o-matic, the only drill turret with the patented, self-centering principle that guarantees sustained accuracy equal to the drilling machine itself.



## FOR ALL CONSECUTIVE DRILL PRESS OPERATIONS

### PROVED PRODUCTION INCREASE

— Turret indexes faster than tools can be changed or work moved to another spindle. A single Lign-o-matic will release 5 drilling machines for other work and still show increased production and reduced costs on original job.

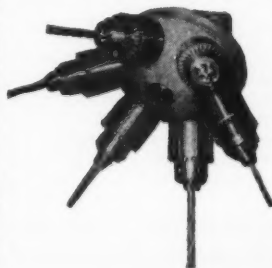
**VERSATILITY**—Fits any standard drilling machine without altering the machine. Handles operations such as drilling, reaming, counterboring, and tapping (on reversible spindle machines), up to 1/2" diameter in any material.

**PRECISION**—Patented, self-centering tapered drive (A) automatically locks turret spindle (B) into exact alignment with drilling machine spindle (C) for sustained accuracy.

**GUARANTEE**—May be returned in 10 days for any reason for full refund of purchase price. Two-year guarantee against defective parts.

**PRICE**—Model D, 6 spindles with No. 2 Jacobs male taper ..... \$235.00  
Chucks extra at established prices.

**DELIVERY**—Currently, 2 weeks.

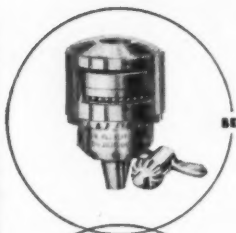


- ☐ Please rush ..... Lign-o-matic turrets for  
(drill press make)..... (size).....  
(quill dia.)..... (spindle taper).....  
My name.....  
Title.....  
☐ Please send literature on Lign-o-matic turret.  
(Attach coupon to company letterhead)

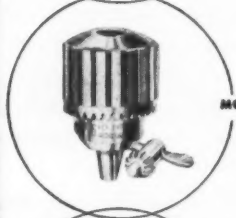
**HOWE & FANT, INC.**  
525 FLAXHILL RD., SO. NORWALK, CONN.

# F OREMOST IN CHUCKS...

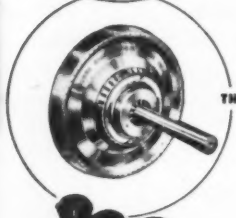
**Unmatched For Accuracy And Gripping Power,  
Jacobs Chucks Are Vital Links Between  
Power Tools And The Finished Job**



**BEYOND ALL COMPARISON.** Say "Jacobs Ball Bearing Super Chuck" and you've mentioned the last word in drill chucks. No other chuck ever made compares with this blue-chip wonder — in which Jacobs' famous ball bearing construction, tough alloy steels and precision workmanship combine for the tightest practical grip and great accuracy. That's why the Jacobs Ball Bearing Super Chuck is tops throughout the world for heavy-duty drilling.



**MOST WIDELY USED DRILL CHUCK IN THE WORLD.** Made of the same rugged materials and to the same close tolerances as the Jacobs Ball Bearing Super Chuck, the Jacobs Plain Bearing Chuck is particularly designed for portable tools and light and medium duty drill presses and lathes. Because of its matchless gripping power and accuracy it has been incorporated as standard equipment by the overwhelming majority of portable tool users both here and abroad.



**THE WORLD'S OUTSTANDING LATHE COLLET CHUCK.** Introduced less than two years ago, the Jacobs Spindle Nose Lathe Chuck has already gained sensational acceptance. Users who want the very best in machine tool performance are insisting on this chuck — thanks to its many improved features, including advantages never before obtainable in collet equipment. For example, there's the amazing capacity range of its collets, each of which closes through a full  $\frac{1}{8}$ " range without the slightest loss of accuracy or gripping power. And only eleven Jacobs Rubber-Flex Collets are required to chuck bars of any diameter between  $\frac{1}{16}$ " and  $1\frac{3}{4}$ " — assuring exceptional savings over the cost of conventional chuck-and-collet equipment.



**THE JACOBS MANUFACTURING COMPANY**  
30 Jacobs Road, West Hartford 10, Connecticut



**FIRMEST IN GRIP**



Jacobs Plain Bearing  
Chuck



Jacobs Ball Bearing  
Super Chuck

Jacobs Spindle Nose Lathe Collet Chuck



**IF IT'S A**

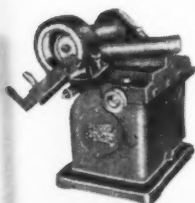
**JACOBS**

**IT HOLDS!**



# IT'S A FACT!

## MACHINE GRINDING



Is the **BEST**  
Method for  
**SHARPENING**  
**DRILLS**



## OLIVER DRILL POINTERS

*Give*

### MORE

ACCURACY  
PERFECT HOLES  
EFFICIENCY

LONGER  
DRILL  
LIFE

We're in a period where manufacturers cannot afford production slow-downs. While our economy is geared to *both* producing needed civilian goods and necessary war materiel, tool rooms must operate at highest efficiency. When properly machine ground, drills give better performance than when ground by hand. Oliver Drill Pointers give balanced cuts with each lip doing equal work—eliminating the excessive drill costs and imperfect holes which can usually be traced to improper drill point grinding.

### THE OLIVER DRILL POINTERS

No. 510 for drills  $\frac{1}{4}$ " to 3"—2-3-4 flute. Variable clearances. Variable point angles. Automatic operation.

No. 21 Oliver Bench Grinder. Hand operated for Drills No. 57 to  $\frac{1}{2}$ ". Right hand, with an improved point. Attachments are available for grinding oil hole drills, left hand and other special points.

Write for literature that will save you dollars in your toolroom.

## OLIVER INSTRUMENT CO.

1408 E. MAUMEE • ADRIAN, MICHIGAN

AUTOMATIC DRILL GRINDERS  
TOOL & CUTTER GRINDERS—DRILL  
POINT THINNERS—TEMPLATE  
TOOL GRINDERS—FACE MILL  
GRINDERS—DIEMAKING MACHINES

BUILD BETTER DIES WITH



DIE MAKERS' SUPPLIES



**PRECISION BOWTIE PINS**

... hardened (58-60 Rockwell C) and ground—resist upsetting in driving.



**CAP SCREWS AND STRIPPER BOLTS**

... knurled socket heads assure easier, faster driving.



**DANLY MACHINE SPECIALTIES, INC.**

2100 South Laramie Avenue, Chicago 50, Illinois

CALL ON THE DANLY BRANCH  
CLOSEST TO YOU FOR FAST LOCAL SERVICE

\*CHICAGO 50, 2100 South Laramie Avenue

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INDIANAPOLIS 4, 5 West 10th Street

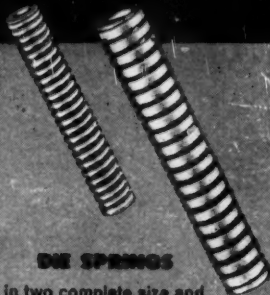
\*LONG ISLAND CITY 1, 47-28 37th Street

\*LOS ANGELES 34, Ducommun Metals & Supply Co.,  
4890 South Alameda

MILWAUKEE 2, 111 East Wisconsin Avenue

PHILADELPHIA 44, 18 West Chelton Avenue

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**DIE SPRINGS**

... in two complete size and pressure ranges to simplify die design.

\*Indicates complete stock.

Want to reduce  
your **TAP BILL**  
**50%? 59%?**  
— even **75%?**

**BLAKE**  
**TAP SHARPENING**  
**EQUIPMENT**  
**DOES THIS**  
**FOR OTHERS**



Ask for Bulletins 549 and 649

**EDWARD BLAKE COMPANY**

Black Diamond Precision Drill Grinders . . . Waltham Cutter Sharpeners . . .  
Waltham Thread Milling Machines . . . Surface Finish Standards.

**No. 3** in a continuing  
study of Tap performance records  
made by users of Blake Tap Sharp-  
ening Equipment.

#### **TAP PERFORMANCE**

**Before Sharpening** Tapping to Class #3 fit an 8-60 L.H. thread in brass— $\frac{1}{8}$ " deep blind hole. Operation performed on automatic screw machine with average standard 3 flute commercial Grd. tap. Number of holes: 2000.

**After Sharpening on Blake Equipment** Tap reground with plus 5° hook in flutes increases average holes per grind to 25,000—an increase of over 1200% per grind. Average six grinds per tap before it is discarded as too small or too short in thread length. Total holes per tap—150,000.

*Why Not You!*

To get dollar-for-dollar value from your taps, you *must* sharpen them just as you do other cutting tools. The Blake Flute Grinder and the Blake Chamfer Grinder provide you with fast, accurate, and economical means for grinding straight flutes, spiral points, and the chamfered ends of your taps — a sure means of reducing your tap bill. Investigate today.



440 CHERRY ST., WEST NEWTON 65, MASS.

**FROM RESULTS PRODUCED,  
INDUSTRY CHOOSES.....**

# LOGAN LATHES FOR PRODUCTION

Results obtained through many years on work of wide variety have established the Logan Lathe as a production tool. Industry chooses and uses more Logan Lathes than ever because Logan versatility, efficiency, durability and economy pay off in profitable production.

## **THESE LOGAN CHARACTERISTICS WILL HELP YOUR PRODUCTION**

### **CAPACITY...**

With 1" collet capacity, 11" swing,  $1\frac{3}{8}$ " spindle hole and center distances of 24" and 36", Logan Lathes have the size to handle substantial work.

### **ACCURACY...**

Less than .0005" spindle runout 12" from the bearing... two V-ways and two flat ways precision ground to within .0005" variation... these are typical Logan Lathe construction tolerances.

### **VERSATILITY...**

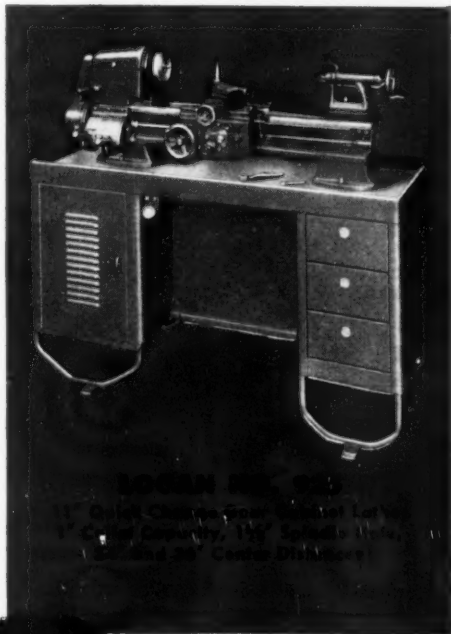
The Logan Lathe gives you spindle speeds of 45 to 1500 rpm with no bearing adjustment. A complete line of accessories further equips these versatile tools for every type of lathe operation.

### **RUGGEDNESS...**

With its ball bearing mounted spindle, its self-lubricating bronze bearings at vital wear points, and its rugged overall construction, the Logan Lathe retains its accuracy and dependability under constant use.

### **ECONOMY...**

By reducing power costs; by saving vital floor space; by quick, easy set-ups; by lasting accuracy and low maintenance; Logan Lathes put many metal turning operations on an economical and profitable basis. The saving to be realized on your original investment in Logan Lathes is a further economy well worth considering.



LOOK TO...

*Logan*

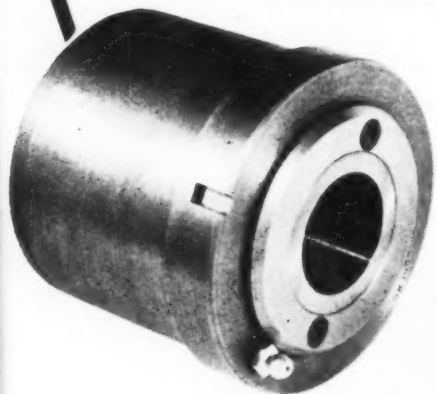
...FOR BETTER LATHES AND SHAPERS

FOR FULL INFORMATION, VISIT YOUR LOGAN DEALER, OR WRITE

**LOGAN ENGINEERING CO.**

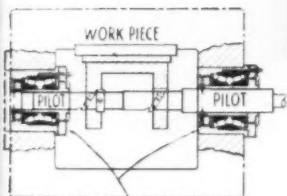
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# JERGENS



*Roller  
Bearing*

## PILOT BUSHING



THE pilot bushing that keeps machines working and earning. Holds "down time" to a minimum, offering effective seal against dust and grit, with extreme accuracy as specified and adjustability for wear. Proven in experience of large users. State your problems for our recommendation.

**J. G. JERGENS CO.**  
11106 AVON AVE., CLEVELAND 5, OHIO

# Raise the Feed with **T-J CUTTERS** for Tough Die Steels!



Increase the output of your machines  
... and *reduce costs*! ... with T-J Die Sinking Milling Cutters!  
They're extra sturdy—you can raise the feed! These cutters  
made from a standard, extremely high grade steel ... properly  
machined ... scientifically heat-treated and accurately  
ground. This means *more work between grinds* ... easier  
cutting ... less breakage ... long cutter life! Wide range  
of T-J standard styles and sizes ... ready for your tough  
jobs! Send for new catalog 150. The Tomkins-Johnson  
Co., Jackson, Michigan.

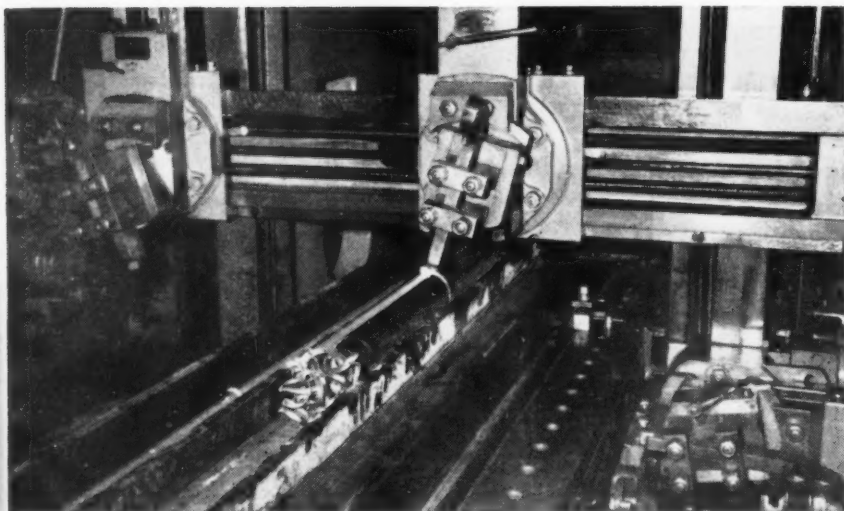
*35 Years Experience*

**TOMKINS-JOHNSON**

DIELECTRIC AIR AND HYDRAULIC CYLINDERS CUTTERS GUNDRILLS







## PRACTICAL DEMONSTRATION OF POWER

Walker Chuck, without supporting back rest, holds tremendous pressure.

*Walker Chucks* save setup time, eliminate need for costly and time-consuming clamps and work-holding fixtures.

*Walker Chucks* Also Permanent Type now available in the following sizes:

	RECTANGULAR		SWIVEL	ROTARY
4" x 8"	6" x 18"	10" x 15"	4" x 8"	4" 12"
5" x 10"	8" x 18"	10" x 24"	6" x 18"	6" 14"
6" x 12"	8" x 24"	12" x 24"	8" x 24"	9" 16"
				10"

*Hold Everything with Walker Chucks*

# O. S. WALKER CO. Inc.

WORCESTER 6, MASSACHUSETTS

*Original Designers and Builders of Magnetic Chucks*



# EXTRA SAVINGS



**Cooler - Cleaner**

**MACHINE TOOLS  
AND WORK**

**FULFLO**

## COOLANT PUMPS

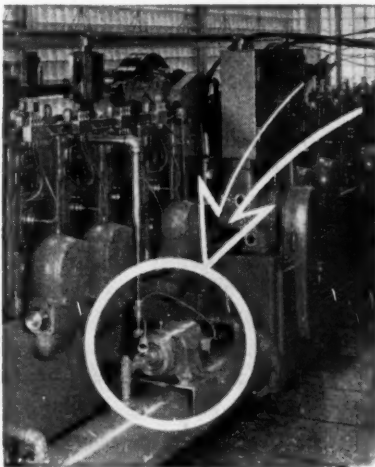
**H**ARD-TO-GET tools must be nursed like babies with production demands at all-time highs.

Keep 'em cool and turn out more and better work with proper coolants brought to the right spot by FULFLO COOLANT PUMPS.

Pipe sizes  $\frac{3}{8}$ " to  $1\frac{1}{2}$ ". Motor, direct or belt drives.

**WRITE NOW** on your letter-head for your copy of FULFLO MECHANICAL DATA BOOK.

*An installation by The American Electric Fusion Corporation.*



THE



**Specialties Co., Inc.**  
BLANCHESTER, OHIO

**INCREASES  
PRODUCTION...**

**LOWERS COSTS...**

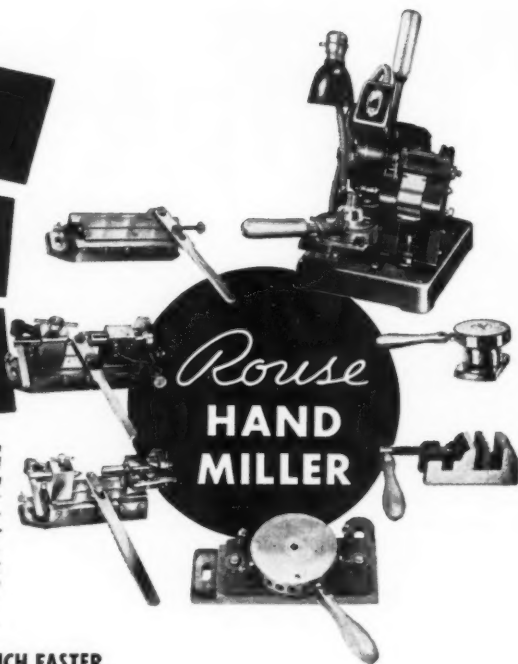
**PAYS FOR ITSELF  
QUICKLY...**

The ROUSE HAND MILLER is a widely used, inexpensive, high speed, ball bearing, motor driven machine for handling light cuts in brass, aluminum, steel, plastics, and other materials—fast, accurately, and at very low cost. Only \$98.00\*.

Fixtures (illustrated) extra.

Motor equipment:— $\frac{1}{4}$  H.P. 110 Volt AC 60 cycle, single phase, swivel motor mount and light—\$25.00\*

\*All prices FOB Chicago.



- ★ **MILLS SMALL PARTS MUCH FASTER.**
- ★ **DRASTICALLY CUTS YOUR INVESTMENT IN EQUIPMENT.** Replaces expensive production machinery—or releases it for other jobs.
- ★ **INEXPERIENCED HELP CAN OPERATE IT.** Safe, simple, fool-proof operation.
- ★ **NO MORE COSTLY SET-UP TIME.** \$98.00\* price so low that it pays to keep one or more Hand Millers always set-up for special operations.
- ★ **YOU GET A BETTER PRODUCT**—the result of ABSOLUTE ACCURACY.
- ★ **A LOSS BECOMES A PROFIT** when marginal pieces are finished on the Hand Miller instead of on high cost equipment.
- ★ **VERY LOW MAINTENANCE.**
- ★ **USED REGULARLY IN 1163 MANUFACTURING PLANTS** (some of which use as many as 30 machines)—yet on the market a scant few years.
- ★ **UNIQUE—VERSATILE.** Nothing else like it. One or several machines can be the answer to some of your production problems.

**Write today  
for further  
information.**

**H. B. ROUSE & COMPANY**

2214 N. WAYNE AVE., CHICAGO 14  
50 YEARS OF SERVICE TO INDUSTRY

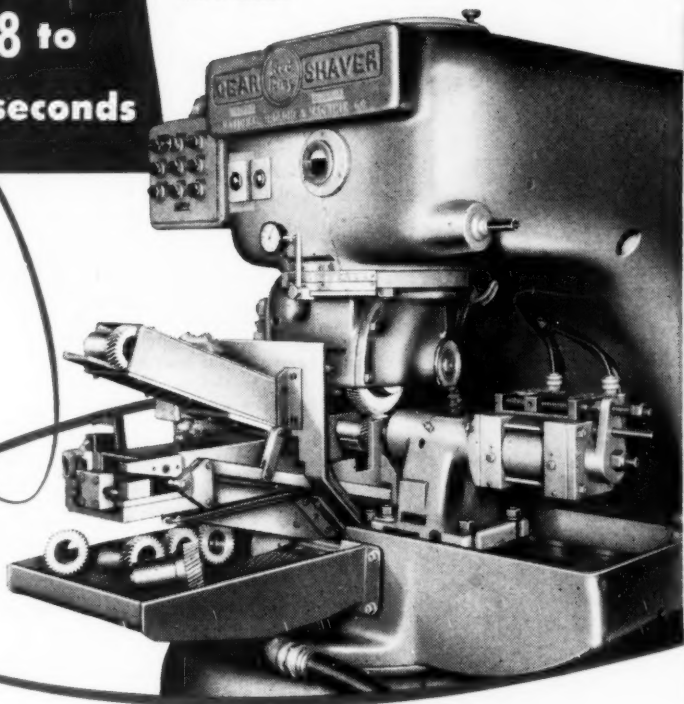
## Transmission Gears

shaved in  
18 to  
22 seconds

The gear on this automatic transmission reverse drive sleeve is  $2\frac{1}{4}$ " in diameter with a  $\frac{7}{8}$ " face, 33 teeth and 14 normal D.P.

It is being shaved on this Red Ring Diagonal Gear Shaving Machine equipped for fully automatic loading at a rate of from 165 to 200 per hour, removing .0025" to .0015" of stock on tooth thickness. Rates up to 300 per hour have been recorded on smaller automotive transmission gears.

Automatic loading gives you not only the highest production rates, but it also minimizes operator fatigue and assures extremely close tolerance gears with ordinary machine operators—no special skill is needed.



SPUR AND HELICAL  
GEAR SPECIALISTS  
MANUFACTURERS OF ROTARY SHAVING  
AND CLIPPING TOOTH FORM



WRITE FOR DESCRIPTIVE LITERATURE ON  
RED RING GEAR SHAVING AND AUTOMATIC LOADING

5628

**NATIONAL BROACH AND MACHINE CO.**

3600 ST. JEAN ..... DETROIT 13, MICHIGAN

WORLD'S LARGEST PRODUCER OF GEAR SHAVING EQUIPMENT

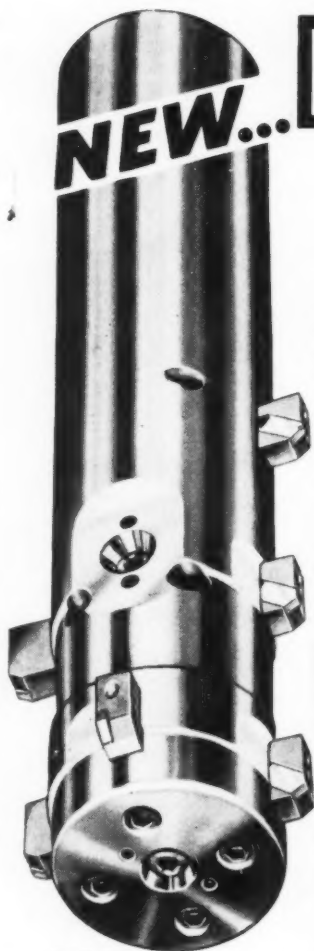
# NEW... DAVIS *car wheel* BORING TOOL

with SOLID  
CARBIDE CUTTERS...



**... Uses Maximum Machine Feeds  
and Speeds to Produce More Wheels  
in Less Time at Lower Cost!**

Solid carbide cutters in the new Davis micrometer expansion car wheel boring tool offer distinct advantages in rough boring with *four* roughing cutters, finish boring with *two* finishing cutters and chamfering with a *single* cutter. Cast iron and steel car wheels are completed faster by using maximum car wheel machine feeds and speeds. Less regrinding time is required for continuous wheel production. This new Davis boring tool may solve your own wheel boring problems. Ask experienced Davis engineers for recommendations.

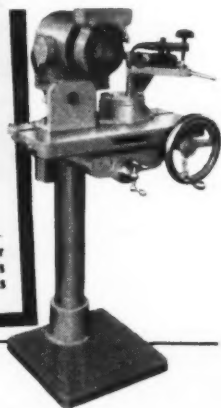


## DAVIS Car Wheel Cutter Grinder

### Efficiently Grinds:

- All "L" Type Cutters
- All Cutting Angles
- H. S. S., Cast Alloy,  
and Carbide
- Chip Breakers

—And is simple to operate—  
requires minimum space near  
wheel boring machine—is  
convenient to keep cutters  
constantly sharp.



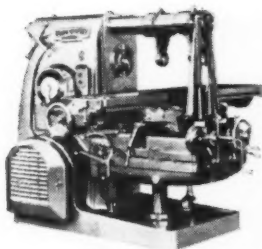
**DAVIS BORING TOOL DIVISION**  
Giddings & Lewis Machine Tool Co.  
Fond du Lac, Wisconsin



A new line of knee-type milling machines

KEARNEY & TRECKER  
MILWAUKEE

CK's



New Model CK  
25 hp No. 5 Plain Style  
Milling Machine

**Y**ES, Kearney & Trecker's new CK milling machines are packed with design and operating features that make them more productive, more profitable for you.

Spindle-mounted flywheel, broad feed and speed ranges and greater horsepower with separate motor drives for spindle, and feed and rapid traverse, mean you get fullest possible benefit from modern cutting tools.

New design 2" diam. table feed screw affords greater bearing contact between screw and nut and is equipped with positive-acting backlash eliminator. These features guarantee smoother feed for conventional and climb milling, give you longer screw life and greater accuracy.

For greater production, these machines are equipped with Kearney & Trecker's famous Mono-Level Control that short-

ens floor-to-floor time, and materially reduces operator fatigue. New, non-glare micrometer dials help avoid costly errors in reading . . . give you a positive lock at every setting.

Automatic flood lubrication in column and knee and positive metered lubrication to table and saddle, plus generously proportioned gears and shafts assure you greater machine life.

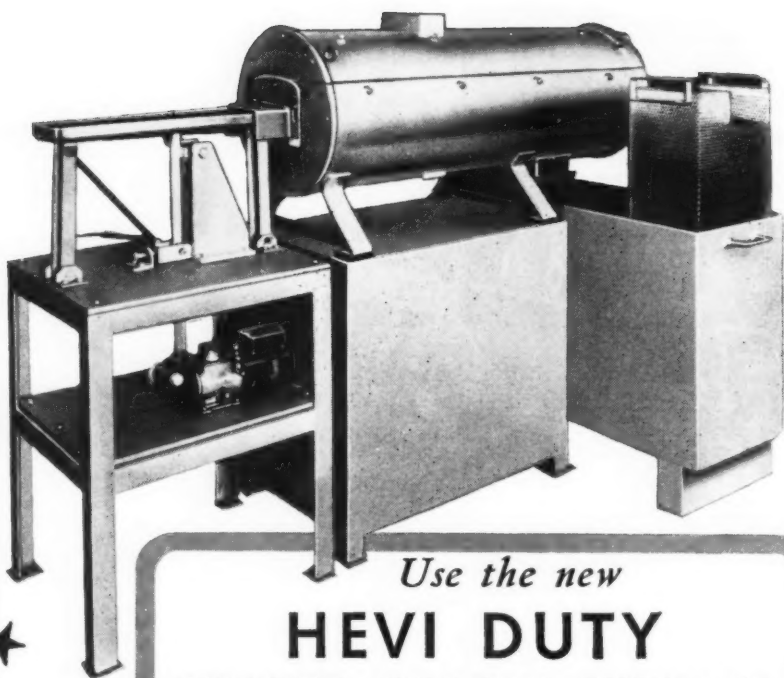
Find out for yourself about Kearney & Trecker's new CK line of knee type milling machines . . . how they meet every demand of modern milling practice, how they can give you greater production at greater profit.

Sizes are No. 2, 3, 4, 5, and 6 . . . Plain and Universal styles. For complete details, contact your nearest representative or write direct. Kearney & Trecker Corp., 6784 W. National Ave., Milwaukee 14, Wisconsin.

REPLACEMENT OF OBSOLETE MACHINE TOOLS  
IS AN INVESTMENT THAT MAKES BOTH DOLLARS AND SENSE

KEARNEY & TRECKER  
MILWAUKEE  
MACHINE TOOLS





*Use the new*  
**HEVI DUTY**  
**SHAKER HEARTH FURNACE**  
*to increase production!*

DESIGNED specifically for production heat treating of small parts, Hevi Duty Shaker Hearth furnaces have proved themselves for Bright Carburizing, Cyaniding and Hardening processes. Close control of case depths can be maintained.

*Write for bulletin HD-850.*

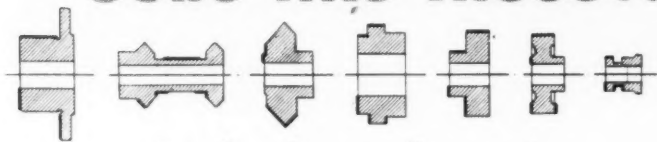
**HEVI DUTY ELECTRIC COMPANY**

HEAT TREATING FURNACES **HEVI-DUTY** ELECTRIC EXCLUSIVELY

DRY TYPE TRANSFORMERS — CONSTANT CURRENT REGULATORS

**MILWAUKEE 1, WISCONSIN**

# Jobs like these...



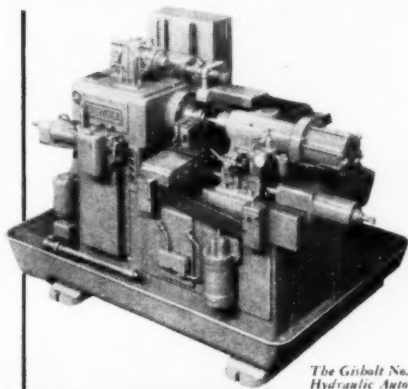
## on a Job-Lot basis...

## on Automatic Lathes?

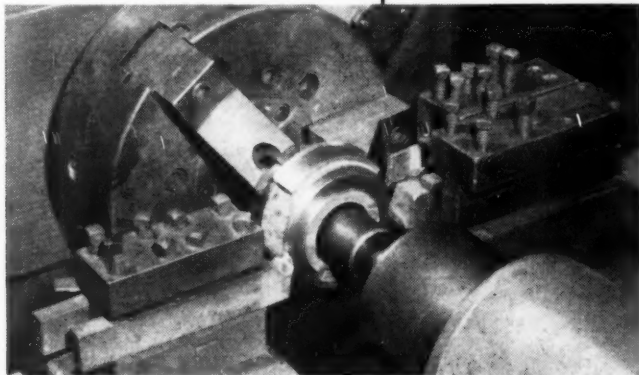
Absolutely! And these are only 8 of over 200 actual small-lot jobs handled on Gisholt No. 12 Hydraulic Automatic Lathes. The Crompton and Knowles Loom Works of Worcester, Mass., has *four* No. 12 Hydraulics busy producing and saving on work like this . . . and all with standard tool blocks!

Job-lot work like this—and like yours—is a natural for the No. 12 Automatic. The cost is no more than a hand-operated lathe for work this size . . . yet you have the added advantages of automatic machining and one-man operation of two or more machines.

If you have contract work like this, now or pending, it will pay you well to get the facts on the No. 12 Hydraulic Automatic Lathe. There's a big 24-page catalog free for the asking.



*The Gisholt No. 12 Hydraulic Automatic Lathe gives you speed and accuracy plus easy set-up.*



**GISHOLT MACHINE COMPANY**  
Madison 10, Wisconsin

THE GISHOLT ROUND TABLE represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.



**TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES**



# America's Greatest QUALITY GRINDER VALUE



**FREE FROM  
VIBRATION  
FOR UNIFORMLY  
QUALITY GRINDING**



## U. S. ADJUSTABLE SPEED SNAGGING GRINDER

**Model 66 . . .**

### **THREE SPEED CHANGES**

Feed this great grinder job after job . . . put it to the most grueling tasks . . . make the most exacting demands . . . and MODEL 66 will come through with flying colors every time.

Belt drive **FREE FROM VIBRATION**. Speed changes to compensate for wheel wear are made by elevating motor on its hinged tray. Patented safety device prevents over-speeding. **WHEEL GUARDS ADJUSTABLE TO WHEEL WEAR.**

**UNITED STATES ELECTRICAL TOOLS IN STOCK AT YOUR JOBBER**

**The UNITED STATES ELECTRICAL TOOL Co.**  
CINCINNATI, OHIO

# LAYOUT FLUID

FOR ANY METAL

Send for

FREE SAMPLE

Your local supply house carries Dayton Rogers' Layout Fluid.

Applicable to all metal. One merely wipes the surface clean and then brushes on the Layout Fluid.

Dries Instantly. No waste. Scribed lines are pronounced and contrast to the dark blue background, thus relieving eyestrain.

Assures greater accuracy and speeds up work. You will save time and money on all layout jobs.

A sample is waiting for you. Send for it today.

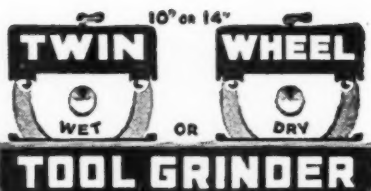


**DAYTON ROGERS**  
*Manufacturing Company*

MINNEAPOLIS 7, MINNESOTA



PATENT PENDING



For Carbide,  
Stellite, or  
High Speed  
Steel Tools.

*one step  
from rough  
to finish grind*

Heavy Duty  
Wet or Dry  
10" - 14" Wheels

## Type TD

10TD 10" - 14TD 14"

### Twin Wheel Tool Grinder

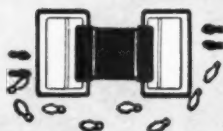
(Also SINGLE CUP WHEEL)

Also:

GRINDERS — ALL KINDS!  
UP TO 100 H.P.

BUFFERS — POLISHERS  
UP TO 60 H.P.

ABRASIVE BELT MACHINERY  
SPECIAL MACHINERY



OLD WAY

Lost time between  
rough and finish grind.

Floor space wasted —  
Grinder must be away  
from wall.



NEW WAY

One step from rough to  
finish grind.

Conserve floor space —  
place Grinder against the  
wall.

Positively no spray or splash when grinding wet!

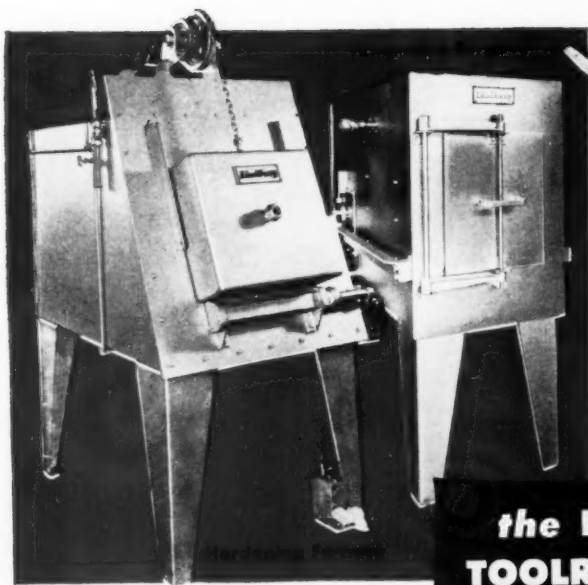
WRITE FOR BULLETIN 18 TODAY!

# THE STANDARD ELECTRICAL TOOL CO.

2486 RIVER ROAD

CINCINNATI 4, OHIO

Visit our Booth 103 Triple Industrial Supply Convention, San Francisco, June 11, 12, 13.  
We would like to discuss type TD with you!



**BASIC  
FOR EVERY  
TOOLROOM**

## **the LINDBERG TOOLROOM TEAM**

When production depends on tools and dies, tools and dies depend on the LINDBERG TOOLROOM TEAM—a basic requirement in every toolroom—a must where you want the ultimate in tools and dies which will keep your production rate up and your machinery running with a minimum of tool and die failure. THE LINDBERG TOOLROOM TEAM gives you the precision heat treating which your precision tools and dies need for lasting performance.

**LINDBERG HARDENING FURNACE** — eliminates finishing due to scale and decarb with simple accurate atmosphere control.

**LINDBERG TEMPERING FURNACE** — allows you to obtain the exact "Rockwell Hardness" required for each specific tool or die.

*For tools and dies requiring high speed tool steel—investigate the Lindberg "L" Type combination preheat—high heat Furnace.*

# **LINDBERG FURNACES**



**LINDBERG ENGINEERING COMPANY**

2442 W. Hubbard Street, Chicago 12, Illinois



ON DISPLAY FOR THE FIRST TIME  
AT THE  
CANADIAN INTERNATIONAL  
TRADE FAIR - TORONTO  
MAY 28TH - JUNE 8TH  
BOOTH 3534, 3526, 3528  
INDUSTRY BUILDING



*Introducing*  
**WILES**

# Drilling Machines

*After 5 Years of Continuous Use in our Plant*

## for PRECISION LOCATING, DRILLING AND REAMING OF HOLES

For the first time, after 5 years of using these Wales designed, engineered and manufactured Drilling Machines in our own plant, they are now introduced to the thousands of manufacturers, who like ourselves, require precision locating, drilling and reaming of holes in material of practically any length and up to 36" wide. There is no other drilling machine or jig borer like it. It fills a definite need.

Accuracy is the primary consideration in building this exclusive, specially designed and ruggedly constructed Wales Drilling Machine which combines simplicity of operation, easier locating and faster production.

Conveniently located built in 1/32" scales and dial-

type gages calibrated in ten thousandths of an inch, used in conjunction with precision end measures, accurately locate the drill head and slide rail.

Have the complete story of this Wales Drilling Machine at your finger-tips by writing for the NEW fully-illustrated, functionally-colored Catalog DM today.

### WALES-STRIPPIT CORPORATION

GEORGE F. WALES, Chairman

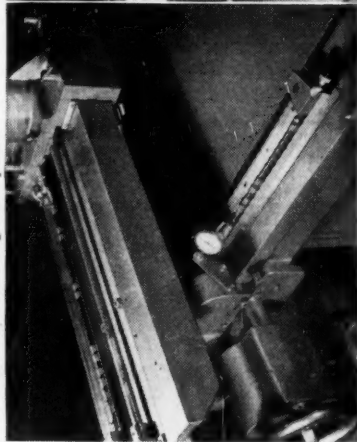
396 PAYNE AVE., NORTH TONAWANDA, N. Y.

(Between Buffalo and Niagara Falls)

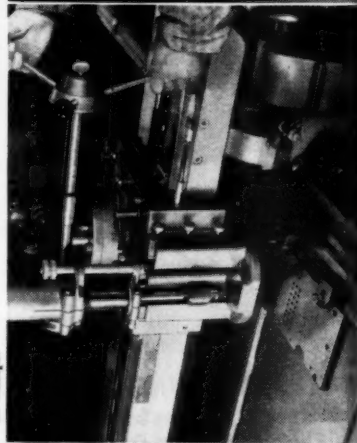
WALES-STRIPPIT OF CANADA LTD., HAMILTON, ONTARIO

*Specialists in Punching and Notching Equipment*

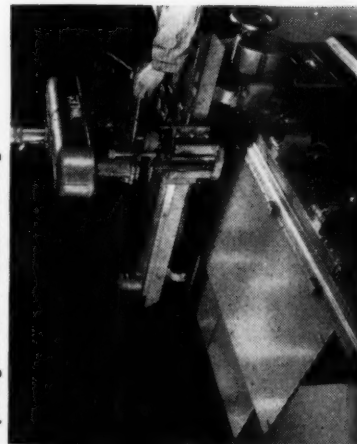
**LOCATING...** Holes are located by placing end measures in V-grooves on bridge and slide rail. Two speed gearing on both front-to-back and right-to-left settings provide rapid traverse for rough positioning and slow speed for "zeroing in". All locking clamps are provided for rigid positioning on both horizontal and longitudinal planes.



**DRILLING...** Showing typical small template being drilled with drill head assembly and slide rail locked in position by air clamps.



**REAMING...** Showing hole in large template being reamed by simply interchanging the drill and bushing with corresponding size reamer and reamer bushing.





# SPEEDY AIR VISE

**SPEEDS UP**

✓ MILLING

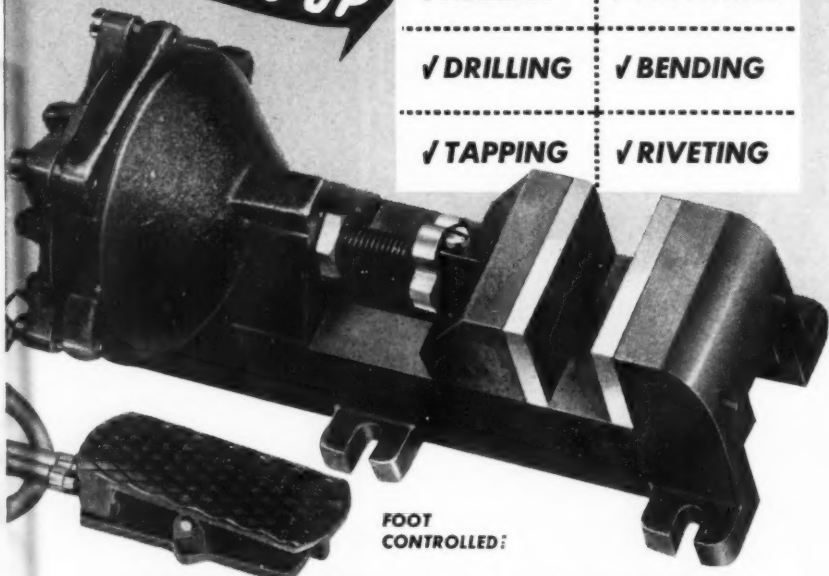
✓ PUNCHING

✓ DRILLING

✓ BENDING

✓ TAPPING

✓ RIVETING



**FOOT  
CONTROLLED:**

## GRIPPING FORCE 15 TIMES AIR LINE PRESSURE

Speedy Air Vise helps you do dozens of operations faster, better, cheaper—by air pressure! Foot control valve opens and shuts vise instantly, leaving both hands free to produce more! Jaw opens up to 3 inches, holds castings, parts, jigs, etc. Compact, trouble-free, inexpensive.

Complete with Foot Control Valve, Air Hose and Fittings . . . only **\$29.90**

ORDER FROM YOUR MILL SUPPLY DEALER OR WRITE DIRECT



### AIR REGULATOR

Precision - built.  
Delivers pressures  
up to 140 lbs. With  
gauge, \$4.95  
Less gauge,  
\$2.95



### AIR FILTER

Keeps water  
and particles  
out of the  
regulator and  
pneumatic  
tools. \$2.45

### BLOW-GUN

Looks and  
operates  
like a gun. Ideal for  
cleaning and blowing  
out chips, dust, filings,  
scraps, etc. . . \$3.00



**W. R. BROWN CORP. • 5724 ARMITAGE AVE. • CHICAGO 39, ILL.**





having **DIE** troubles?

RAPID WEAR !

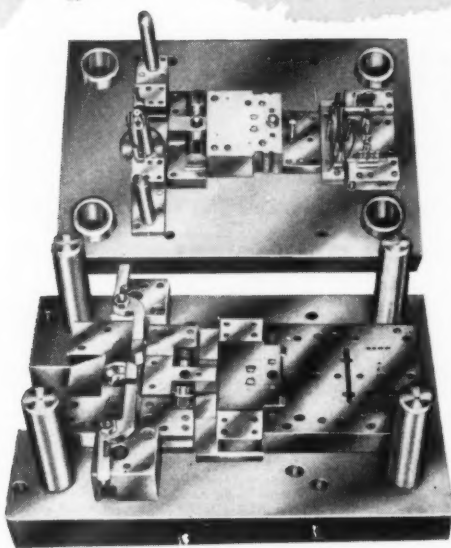
BREAKAGE !

EXCESSIVE BURRS !

CHIPPING !

SCORING !

DIMENSIONAL ERRORS !



let America's  
foremost die-maker  
prove to you that  
good tooling pays off

You pay for Precision Dies—  
why not get them!



**HARIG**

MANUFACTURING CORPORATION

323 NORTH ALBANY AVE. CHICAGO 12, ILLINOIS

# NEW HAUSER

## BURNISHING METHOD

Faster and More Accurate Than Any Other Lapping, Grinding or Polishing Method Known

NOW AVAILABLE FROM U.S. STOCKS

### HAUSER

Type 241 Pivot Polishing Machine for Wet  
Polishing—600 or More Pivots Per Hour

REPLACES CENTERLESS GRINDING

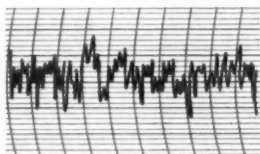
#### FEATURES:

- Polishes to 0.2 to 0.3 micro-inch R.M.S.
- High precision—Simple operation
- Low Cost Polishing
- Polishing range: Min. dia. 0.008"
- Max. dia. 0.197" Length to 0.315"
- Workpiece length to 5"
- Polishes straight, taper or radius
- Polishes shoulder at same time as cylinders at right angle or bevel as desired
- Polishes wide range of metals
- Takes work in collets or between centers
- Long life carbide or ceramic wheels
- Can be equipped with production-run time switch

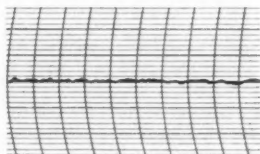
Factory Service and Parts are available from Manhasset, N.Y.

#### ANALYZING CHART

BEFORE BURNISHING



AFTER BURNISHING



Magnification: 40,000 vertical — 88 horizontal

#### HAUSER TYPE 241

Pivot Polishing Machine can be supplied with or without base, as desired.

### HAUSER

MACHINE TOOL CORP.  
AFFILIATED WITH  
CARL HIRSCHMANN CO.

30 Park Avenue, Manhasset, N.Y. • Representatives in Principal Cities



Sole U. S. agents for Henri Hauser Ltd., Bienne, Switzerland—Jig Bore, Jig Grinders, Optical Measuring Machines, Profile Projectors, Burnishing Machines



At 30 Park Avenue, Manhasset, N. Y., is the widest selection of Swiss precision machine tools available from any one address in the United States. Represented here, in addition to Henri Hauser, Ltd., are Tornos Works, Ltd.; Schaublin, S. A.; S. Lambert, S. A.; Safog, S. A.; and Agathon, Ltd., which are handled exclusively by Carl Hirschmann Company.

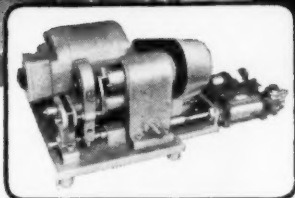
# SWISS PRECISION CRAFTSMANSHIP SWISS DEPENDABILITY ACCURACY

*You can NOW speed*  
deburring, chamfering, pointing,  
facing, center-drilling, and  
reaming operations with

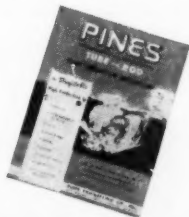


## PINES END-FINISHING MACHINES

Handle broad range of rod, tube, and pipe end-finishing work with speed and precision. Exclusive chuck feature clamps and feeds work to cutters in one motion. Operator always has one hand free for stock handling. Designed with quick interchangeable tool holders and chuck inserts, 8-speed sheave — 760 to 3920 r.p.m., hardened and ground spindle, grease-sealed precision bearings. Automatic swing-type stock stop assures fast, accurate positioning. Entire unit is portable, takes up small space, handles stock diameters up to 2". Max. feed is 1 1/4". Larger sizes up to 5" capacity available. **Typical production: 800 tube ends per hour.**



(Above) Pines 2" High Production End-Finishing Machine equipped with foot-controlled air operating cylinder. Clamp, feed, and return cycle is automatic. Operator has both hands free for stock handling. Supplied similar to hand-operated unit.



**PINES**

ENGINEERING CO., Inc.

*Specialists in Tube Fabricating Equipment*

698 WALNUT • AURORA, ILLINOIS

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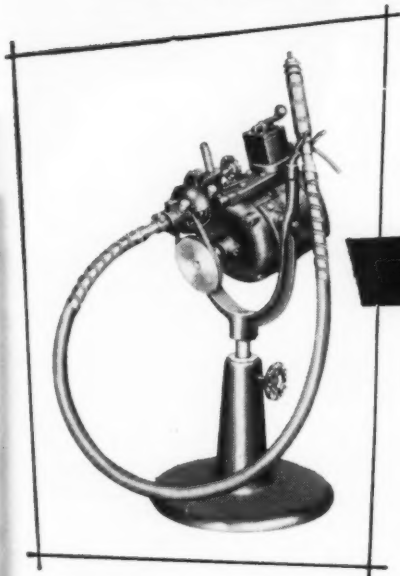
Write today for free bulletin and learn how these machines are built to save time on a wide range of work.

Step-up your production with



Flexible Shaft Machines

### BENCH MOUNTING



Here is convenient flexible shaft equipment that can be mounted on bench right near the work.

Portable to the extent that it can be taken from place to place. For steady, fast production, consider the bench-mounted flexible shaft machine as part of your production setup.

Model shown is three-speed mounted on swivel type adjustable bench column. Available in  $\frac{1}{8}$  H. P.

### FLOOR MOUNTING

The floor-mounted flexible shaft machine is one of the most popular. It can be moved from place to place. Amply powered, the standard is out of the way while the head is light and easy to work with.

Model shown is three-speed mounted on swivel yoke adjustable floor type tripod.

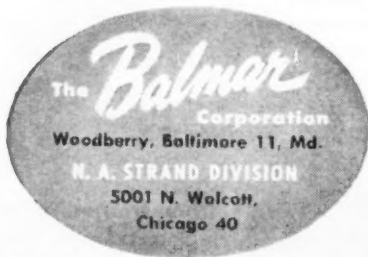
Available in  $\frac{1}{8}$  H. P. to  $1\frac{1}{2}$  H. P. inclusive.



# STRAND

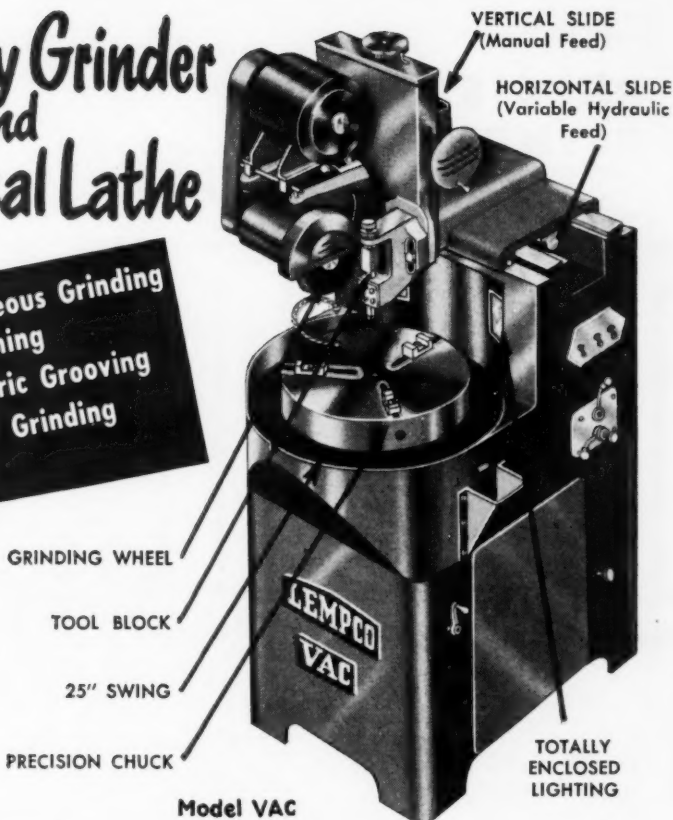
FLEXIBLE SHAFTS and  
FLEXIBLE SHAFT MACHINES

SALES OFFICES: CHICAGO, BALTIMORE and TULSA



# Rotary Grinder and Vertical Lathe

- ✓ Simultaneous Grinding and Turning
- ✓ Concentric Grooving
- ✓ Surface Grinding
- ✓ Facing



**Model VAC**

**60 day  
delivery**

A surface grinder and vertical lathe for short work pieces of comparatively large diameter. Besides its use in sharpening dies it can turn short work pieces, cut and grind simultaneously or remove large quantities of metal on surfaces up to 18" x 18" square or 25" diameter that might ordinarily require a shaper, milling machine, or large swing horizontal lathe.

for details write  
**LEMPCO PRODUCTS, INC.**

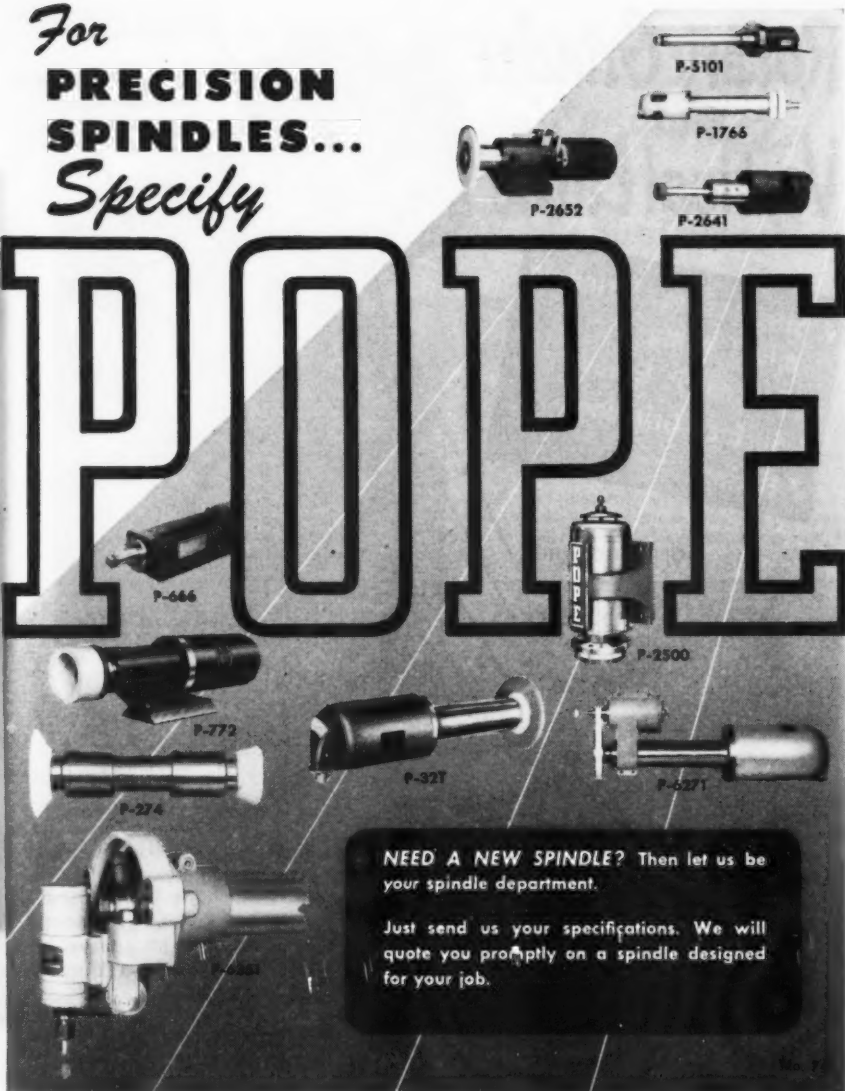
Industrial Division  
5490 DUNHAM ROAD  
BEDFORD, OHIO

# LEMPCO

**For 35 Years — a leading builder of machine tools**

For  
**PRECISION  
 SPINDLES...**  
*Specify*

# POPE



**NEED A NEW SPINDLE?** Then let us be  
 your spindle department.

Just send us your specifications. We will  
 quote you promptly on a spindle designed  
 for your job.

# POPE

TRADE MARK REG. U.S. PAT. OFF.

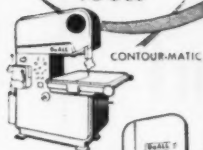
**POPE MACHINERY CORPORATION**

ESTABLISHED 1920

261 RIVER STREET • HAVERHILL, MASSACHUSETTS  
 BUILDERS OF PRECISION SPINDLES

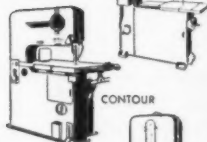


# DoALL INDUSTRY'S NEW SET OF TOOLS



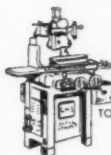
CONTOUR-MATIC

ZEPHYR



CONTOUR

BAND FILER



TOOLROOM GRINDER

CRUSH GRINDER



"COOL GRINDING"  
ATTACHMENT



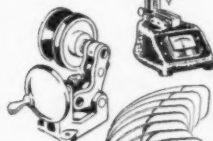
BLADE WELDER



GAGE BLOCKS

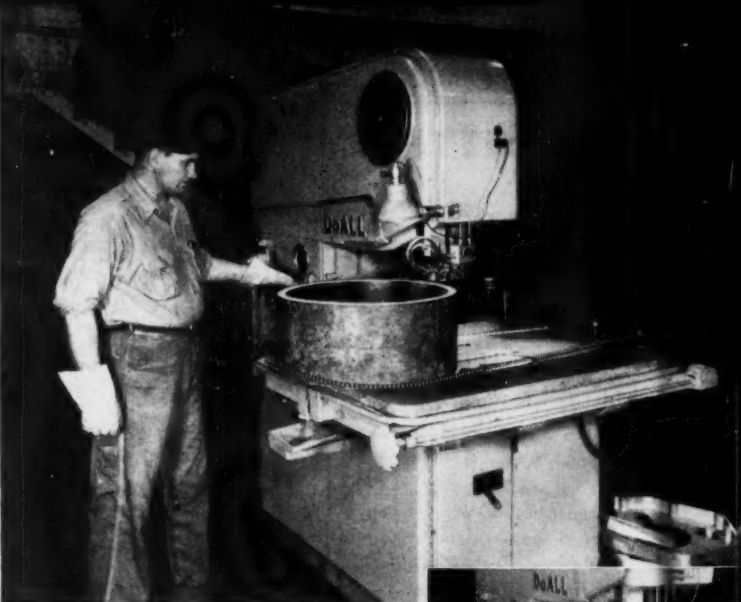


GAGE ACCESSORIES



VARIABLE  
SPEED  
DRIVES

SAW BANDS



National Acme Company, Cleveland, reduces cost of cams and gears. One of the first steps in production of Acme cams is splitting the ring shown above into segments. DoALL MP-20 makes cut through  $9\frac{1}{4} \times 1\frac{1}{2}$ " wall thickness in three minutes.

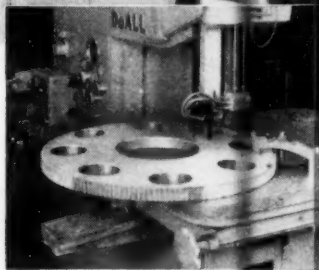
## It's EASY TO SAVE . . .

**MANPOWER**—Hydraulic controls and power feed simplify operation and increase output. Operators attain skill in short time. Reduces labor cost.

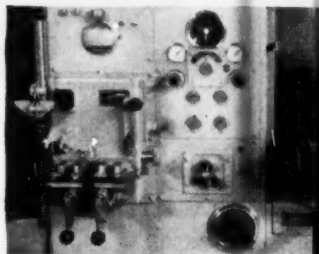
**MACHINE POWER**—Preliminary metal removal and shaping by hydraulic powered band machining technique saves time of more costly machines. Expanded speed range and new Band Tools cut any material.

**MATERIAL**—Band Machining technique cuts directly to layout line, removing surplus metal in usable form in record time. Reduces scrap loss—less chips, less waste.

**SEE IT DONE ON THE MODEL MP-20**—Ask our Machine Tool Specialist to demonstrate the CONTOUR-MATIC Band Machine that creates entirely new manufacturing possibilities.



Tough alloy gear  $1\frac{1}{4}$ " thick is split in 16 minutes "floor to floor time." MP-20 provides required band speed and feed pressure.



Centralized operating panel controls speed of tool, feed pressure of table, welding the tool, and coolant facilities.



TOOL STEEL



BENCH FILER



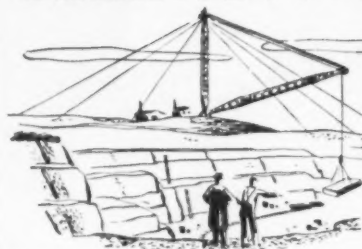
Des Plaines, Ill., U.S.A.  
Cable Address: DoALL, Des Plaines

DoALL Stores  
In Key Cities

Factory Trained  
Representatives Everywhere



**GRANITE . . . for**



# Permanent Precision

• Since the beginning of history, granite has been the universal symbol of absolute permanence. Created by nature in a process requiring millions of years, granite belongs to various periods ranging from the pre-Cambrian to the Tertiary. It was originated by the cooling of an acid magma under tremendous pressures, at great depths in the earth's crust.

Ageless in its permanence, unmatched in

its properties of hardness, granite serves through generations, through centuries, without the least evidence of wear. Its durability and hardness make granite ideal for applications where even the most minute variations must be eliminated. Warp-proof, corrosion-proof, and unaffected by ordinary temperature changes, granite is the logical basic material for permanently precise surface plates.

**for precision  
measurement  
operations**



## GRANITE SURFACE PLATES

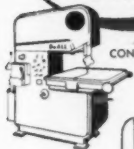
*Produced by Nature . . . Perfected by*

*The Herman Stone Co.*

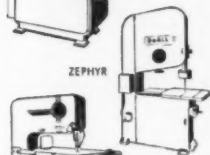
324 Harries Bldg., DAYTON 2, OHIO

# DoALL

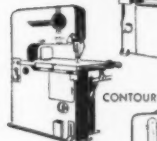
INDUSTRY'S  
NEW SET OF  
TOOLS



CONTOUR-MATIC



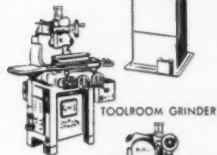
ZEPHYR



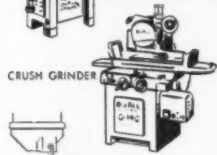
CONTOUR



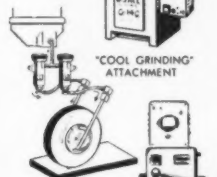
BAND FILER



TOOLROOM GRINDER



CRUSH GRINDER



"COOL GRINDING"  
ATTACHMENT



BLADE WELDER



GAGE BLOCKS



GAGE ACCESSORIES



VARIABLE  
SPEED  
DRIVES

SAW BANDS



An 8" x 14" Automotive Blanking Die made of hi-carbon, hi-chrome, air hardening tool steel at Advance Tool Stamping & Die Co., Columbus, Ohio. Shown here being sharpened.

**DoALL**  
**COOL GRINDING**  
U. S. Patent 2470350  
(Coolant-  
through-the-wheel)

## NO DOWN TIME

## 6 MONTHS WITHOUT STOPPING

This DoALL Model G-10 Surface Grinder has been running day and night continuously for 6 months without any "down" time. A great many dies similar to the above are made and maintained in this modern shop. Machining on the DoALL is so smooth that polishing is not necessary.

### Cool Grinding—Cools the Cut and the Work

A patented technique used with DoALL Grinders exclusively, produces more accurate finishes in much less time and cutting edges that last longer.

### Full Visibility

You can see the work at all times. No messiness from old style coolants. Splash guards unnecessary.

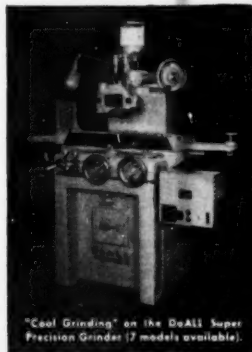
### Rigid as a Rock

Base and column support cast as one piece. DoALL Grinders are massive and rigid. Model G-10 weighs 3350 pounds.

### Precision Plus

DoALLs are built extremely accurate as to flatness, parallelism, dimensional control and surface finish.

SEE ONE WORK. Call your local DoALL Store today. They'll arrange a demonstration—without obligation—of this revolutionary Surface Grinder and Cool Grinding.



"Cool Grinding" on the DoALL Super Precision Grinder (7 models available).



TOOL STEEL



BENCH FILER

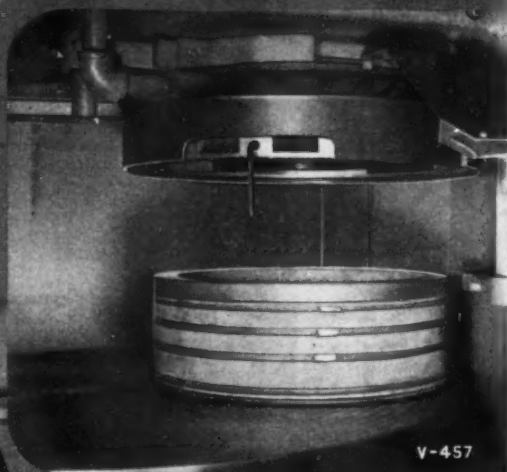


**The DoALL Company**  
Des Plaines, Ill., U.S.A.  
Cable Address: DoALL, Des Plaines  
DoALL Stores in Key Cities  
Factory Trained Representatives Everywhere

for your BLANCHARD

*So easy!*

lower head  
onto wheel  
and clamp-



-then grind!

Blanchard wheels are engi-  
neered for Blanchard Grinding

The NEW Blanchard Wheel Holder eliminates sulphur-  
ing — try it with Blanchard wheels and be convinced  
that it will —

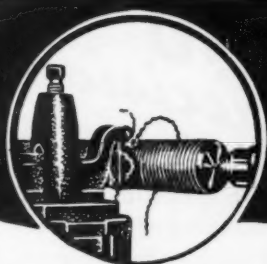
**SAVE TIME**  
**SAVE MONEY**  
**SAVE TROUBLE**

*See your Blanchard distributor or  
write direct for full information!*

PUT IT ON THE  
THE BLANCHARD MACHINE COMPANY



64 STATE ST., CAMBRIDGE 39, MASS., U.S.A.



## *Increase YOUR* **HOURLY OUTPUT!**

On Lathes and other machines using centers, CMD LUBRICANTS prevent dangerous seizure, waste and costly delays.

*Lubricate Machines  
with Longer-Lasting*



*Anti-Scoring*  
**LUBRICANTS**



On Die Set Pins and Bushings CMD LUBRICANTS minimize wear and time-out to re-lubricate.

For smooth performance and greater man-hour production, protect your machines with CMD Anti-Scoring Lubricants. Because they withstand pressures greater than 50,000 pounds per square inch and will not mulsify with liquid coolants, they protect bearing surfaces better and longer. Illustrated here are just a few of the many applications where CMD Lubricants are cutting costs. But see for yourself. Test CMD Lubricants on your toughest operations.



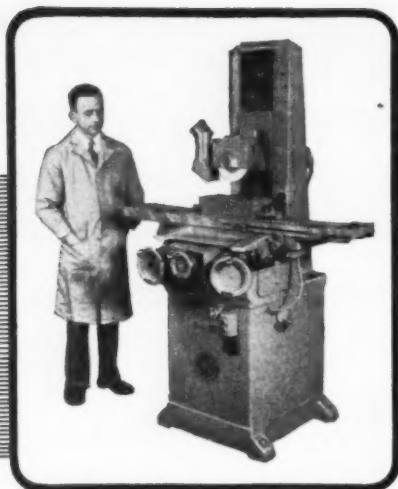
On Steady-Rests CMD LUBRICANTS assure smooth, true turning of work and complete freedom from scoring and seizure.

**Write for FREE Samples!**  
**Address Dept. 6-BB**



**CHICAGO MANUFACTURING  
& DISTRIBUTING CO.**

**1928 W. 46th St. • Chicago 9, Ill.**



**REID MODEL 618 WITH VARIABLE TABLE  
SPEED—12 to 35 FT. PER MINUTE**

# REID *Precision*

**SURFACE GRINDERS** Are Universally Accepted Because of Their High Precision Performance. Each Precision Problem Has Been Mastered Through Long Research.

**Correct Balance and Weight  
Ample Dust Protection  
Proper Bearing Application  
Shafts of Right Hardness  
Controls at the Fingertips**

## CALL YOUR CONVENIENT REID DEALER

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	San Francisco	Underhill 1-6272		Buffalo	Madison 2296
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	Stamford	Haven 7-5751		Rochester	Baker 6570
		Stamford 4-1164		Syracuse	2-7246
District of Columbia	Washington	National 2286	North Carolina	Charlotte	3-1921
Florida	Jacksonville	4-6781	Oklahoma	Oklahoma City	7-5576
	Miami	2-8419	Ohio	Cincinnati	Cherry 6442
Georgia	Atlanta	Vernon 7233		Cleveland	Superior 1-4400
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	Chicago	Kedzie 3-0210		Cleveland	Main 1-5124
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Iowa	Davenport	7-8115		Philadelphia	Market 7-6100
	Des Moines	3-6173		Pittsburgh	Court 1-4860
Kentucky	Louisville	Magnolia 4686	Rhode Island	Pittsburgh	Locust 1-1471
Louisiana	Baton Rouge	3-8341	Texas	Pittsburgh	Atlantic 1-6091
Massachusetts	Boston	Hancock 6-6460		Providence	Jackson 1-3446
	Boston	Hancock 6-5380		Dallas	Prospect 1521
	Worcester	6-5175		Houston	CA-6551
	Worcester	6-7171		Houston	CA-2251
Michigan	Detroit	Temple 2-3540	Utah	Salt Lake City	3-5771
	Muskegon	26-655		Richmond	82-4581
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	St. Louis	Central 0683	Wisconsin	Milwaukee	West 3-4920
New Jersey	Newark	Market 2-4318	Quebec, Canada	Montreal	University 2851
			Ontario	Toronto	Adelaide 6731
				Toronto	Empire 3-1463
				Windsor	2-5676

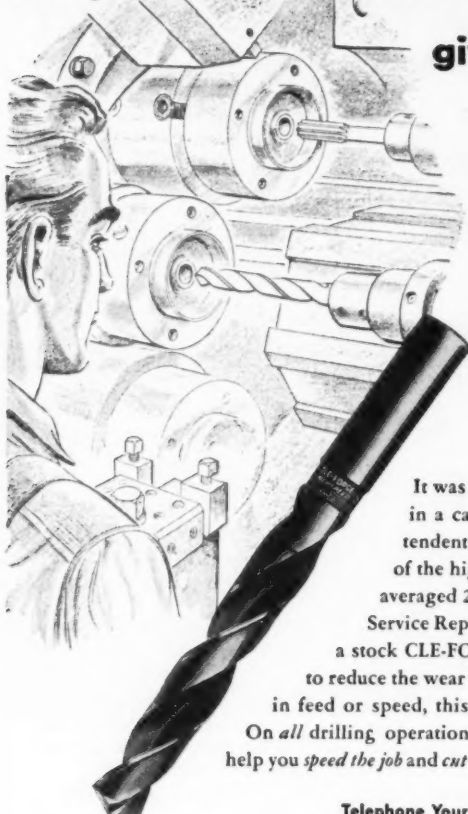
**REID BROTHERS COMPANY, INC.**  
**BEVERLY, MASSACHUSETTS**

*Established in 1900*

test proves that *Better Wearing Qualities*  
give you

**42%**

**MORE HOLES  
PER GRIND**



It was a smooth-running job—drilling  $\frac{1}{8}$ " holes in a cast iron cover,  $\frac{1}{2}$ " thick—but the superintendent wasn't satisfied with the wearing qualities of the high speed drills that were being used. They averaged 2705 holes per grind. ♦ When a *Cleveland* Service Representative was called in, he recommended a stock CLE-FORGE High Speed Drill that is engineered to reduce the wear caused by abrasive action. With no change in feed or speed, this drill averaged 3862 holes per grind! ♦ On all drilling operations, a *Cleveland* Service Representative can help you *speed the job and cut costs*. Contact our nearest Stockroom, or...

Telephone Your Industrial Supply Distributor

1876 1951



THE MARK OF QUALITY  
FOR 75 YEARS

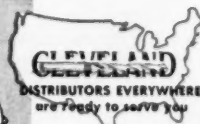
**THE CLEVELAND TWIST DRILL CO.**

1242 East 49th Street

Cleveland 14, Ohio

Stockrooms: New York 7 • Detroit 2 • Chicago 6 • Dallas 1 • San Francisco 5 • Los Angeles 38

E. P. Burros, Ltd., London W. 2, England



ASK YOUR INDUSTRIAL SUPPLY DISTRIBUTOR FOR THESE AND OTHER *Cleveland* TOOLS



**2½-inch Capacity — Cuts  
finished 2x4s at 45° mitre**



**POWERFUL  
COMPACT  
RUGGED  
SAFE**

# A New Champion

**for faster, easier sawing**

Here is an outstanding new value — ideal for general construction and maintenance work. Driven by a full ½ h.p., it has ample power, and its 7-inch blade will handle 90% of all sawing jobs. Light, compact and balanced to a T — it's ruggedly built to take the grind of rough, continuous use. Rips and cross cuts hard and soft woods. Using abrasive discs, it cuts metals, concrete, tile, etc. At only \$75.00, it's one of the finest values we've ever offered. Write for full details. Let us send you data, too, on Millers Falls 9- and 10-inch heavy-duty saws and the whole Millers Falls line of high-production, high-speed portable electric tools.

MILLERS FALLS COMPANY • GREENFIELD, MASS.

**MILLERS FALLS  
TOOLS**

SINCE  
1868

*The Mark of Superiority.*

**\$75<sup>00</sup>**

**complete with enameled  
steel carrying case**

**Here are the big features  
of Millers Falls new No. 700  
7-inch Portable Electric Saw**

- Light weight — only 11 lbs. — yet ample power for general construction and maintenance.
- Precision cut, helical gears. Ball bearings throughout. Extra rigid steel base with adjustable ripping guide.
- Uses any standard 7-inch blades and abrasive discs with ⅝-inch arbor hole.
- Compact and easy to handle — the smallest size saw that will take 45° cuts in finished 2x4s.
- Quick, simple, positive adjustments for depth (23½" to ¾") and angle (90° to 45°).
- Safety assured by completely guarded saw and instant trigger switch control.



# "MX"

## **...works fast, works safe!**

"MX" Products by CARBORUNDUM are made from cotton fibres and selected abrasive grain types combined with specially developed organic bonds. They retain fast cutting action for extended work periods and feature a high safety factor. "MX" products include plain, straight or depressed center wheels

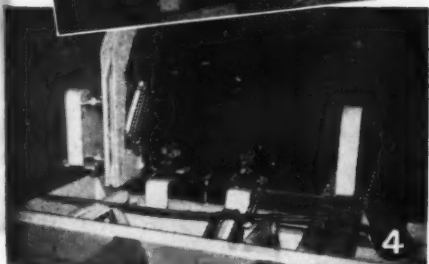
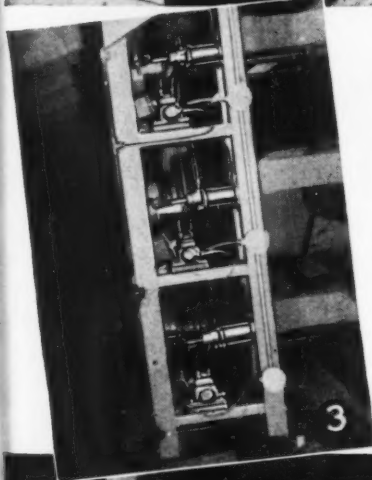
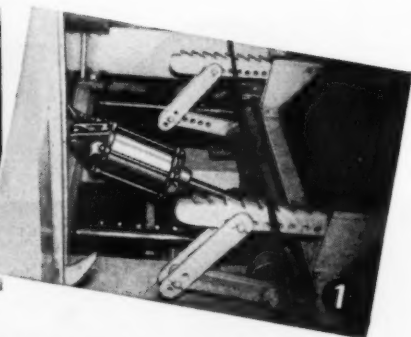
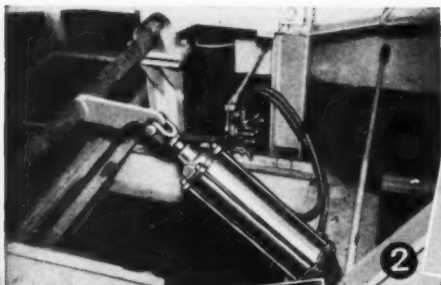
for portable grinders. These wheels meet the varied needs of portable grinding in cut-off, slotting, edge breaking, deburring, weld grinding and surface finishing operations, and all these operations can be performed with maximum safety. Use "MX" products, reduce the necessity for wheel changes.

# **Only CARBORUNDUM**

TRADE MARK

"Carborundum" and "MX" are registered trademarks which indicate manufacture by The Carborundum Company, Niagara Falls, N. Y.

*makes ALL Abrasive Products  
...to give you the proper ONE*



## LUMBER and VENEER MILLS Find Many Uses for NOPAK Valves and Cylinders . . .

The four applications pictured here are typical of hundreds now in operation in the lumber and wood products industries. Lifting, tilting, pushing, pulling and clamping operations are readily simplified and accelerated through proper application of NOPAK Valves and Cylinders of the correct size and type.

In modernizing machines or equipment which you use in your own plant, or build for others, consider the advantages of using Air or Hydraulic Power the NOPAK way. For data and descriptions, refer to Sweet's File for Product Designers, or write for Bulletin SW-1.

### GALLAND-HENNING MFG. CO.

2754 S. 31st Street, Milwaukee 46, Wisconsin  
Representatives in Principal Cities

# NOPAK

## VALVES AND CYLINDERS

### DESIGNED for AIR and HYDRAULIC SERVICE

A 5913-1/2I

1. Cant Flipper actuated by NOPAK Model "E" Cylinder.
2. Log Deck Flipper-Arm Set-Up operated by 6"x18" Model "E" Cylinder controlled by NOPAK Model "R" Foot Valve.
3. NOPAK 3" x 3" Model "E" Cylinders, controlled by Model "F" Solenoid Valves, actuate clutches on Veneer Trays.
4. Saw Carriage equipped with 4" x 12" and 8" x 10" NOPAK Cylinders.

# A **LENOX** Band Saw Blade For Every Cutting Problem

## **LENOX** Friction Cutting Band Saw Blades

For Use only on  
High Speed Machines  
in Cutting  
Stainless Steels  
Sheet Metal, Armor Plate  
and  
Other Varied Applications

## **LENOX** Skip-A-Tooth Band Saw Blades

For Cutting  
Aluminum Magnesium  
Plastics Builders Board  
Hardwoods Plywoods  
Soft Woods Carbon  
Paper Board

## **LENOX** Regular Metal Cutting Band Saw Blades

For Cutting  
Alloy Steel Tool Steel  
Stainless Steels  
Machine Steel  
Cold Roll Steel

*"The Tools in the Plaid Box"*

**LENOX**

**AMERICAN SAW  
& MFG. COMPANY**  
Springfield, Massachusetts

HACK SAWS BAND SAWS GROUND FLAT STOCK

## *A New High* **IN DRILL CHUCK ENGINEERING**

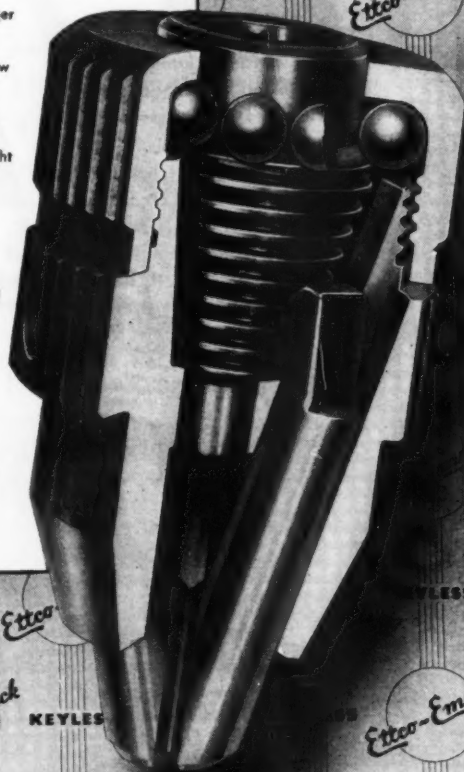
■ New precision standards, longer life, easier operation, fool-proof action—they're features of the new Ettco-Emrick Keyless Drill Chuck.

There's no slipping, no damaged drill shanks—the grip is always tight and true. Yet only a slight twist of the chuck body is needed to release the drill.

You need a chuck that's tops in simplicity and design. Save time! Save money! Ask your Industrial Distributor for the new Ettco-Emrick Keyless Drill Chucks and Shanks.

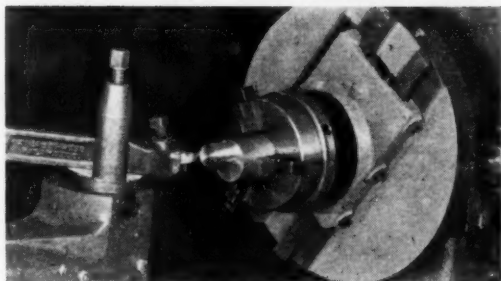
**ETTCO TOOL CO., INC.**  
596 JOHNSON AVENUE  
BROOKLYN 6, NEW YORK

☛ Fully described in bulletin #7.



# MICRO LATHE PLATE SAVES SET-UP TIME

Saves time. Saves work.  
Converts your lathe into  
a boring mill in 60 sec-  
onds! Enables lathes to do  
offset turning, or bore  
three holes not in line,  
without removing work  
piece.



## Adjustable Slide on Face Plate Centers Work Quickly

This *MICRO FACE PLATE* has boss on an adjustable slide. Ell Plate or any special fixture locks to boss quickly. By moving slide across face plate and rotating fixture on boss, any point of work is brought in exact spindle center.

Boss saves bolting Ell plate to face plate. Work can be clamped to fixture in approximate position without taking time to locate it accurately.

In 60 seconds your lathe is ready to accurately machine odd shapes and do offset work.



*Ell Plate quickly attaches to boss on face plate.*

*3 jaw chuck fastens to slide with a screw in stud.*

Ell Plate, 3 jaw chuck and *MICRO FACE PLATE* equip your lathe to do work that formerly required three or more machines. Face Plate has 8 inch diameter, fits any lathe spindle having 1½" to 8 pitch thread.

**MICRO LATHE PLATE, INC.**  
CLEVELAND 13, OHIO

## MAIL COUPON FOR CIRCULAR

**MICRO LATHE PLATE, INC.**  
1265 West 2nd Street  
Cleveland 13, Ohio

Please send circular describing Face Plate, Ell Plate and Three Jaw Chuck.

Name .....

Address .....

City ..... State.....



*Here's Proof*  
The New Thompson Type 2F is a  
**SUPER PRECISION**  
Tool Room Grinder

Please Use Only Webber Gage Blocks  
When You Use Your Grinders



**WEBBER GAGE COMPANY**  
12900 TRISKETT ROAD - CLEVELAND 11, OHIO

November 10, 1960

Mr. Wilson, Vice President  
Thompson Grinder Company  
Springfield, Ohio

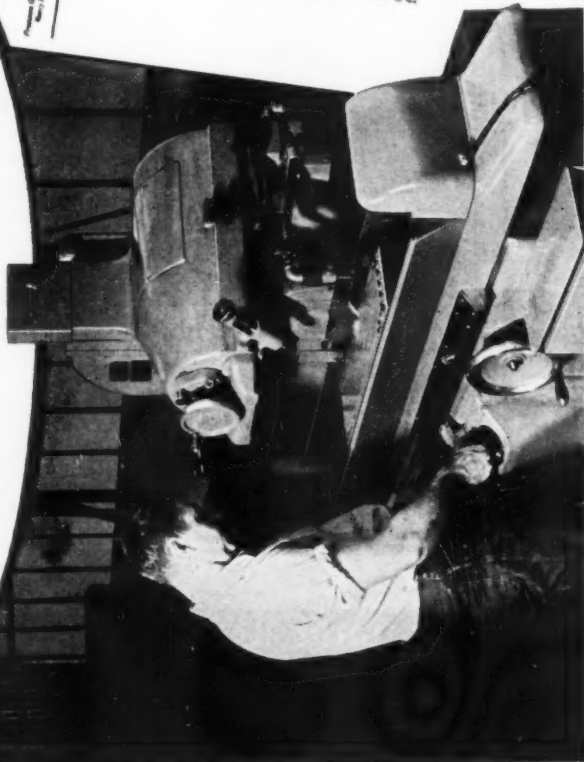
Dear Mr. Wilson:

We recently installed a new THOMPSON Tool Room Grinder to grind Gage Blocks to our specifications and tolerances; the results have been very satisfactory and in spite of the close limits to which the work has to be done. We thought you would be interested in the performance of this machine.

Very truly yours,

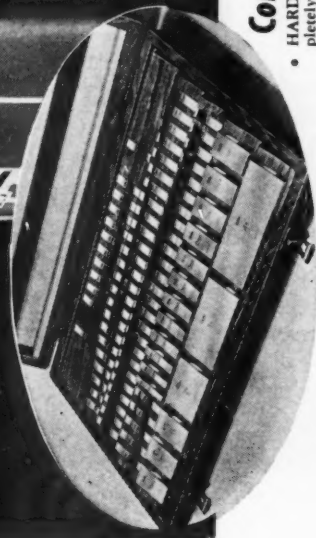
**WEBBER GAGE COMPANY**

*George D. Webber*  
George D. Webber



Thompson 2F Grinder Photographed in the Webber Gage Co., Cleveland Plant

## COMPARE THIS NEW 8 x 10 x 24 TOOL ROOM GRINDER



*When working to a tolerance of four millionths of an inch such as is observed when making Webber Gage Blocks, the rough or preliminary grinding plays an important role in keeping cost of the final finishing within reasonable limits.*

### Compare These Features:

- HARDENED AND GROUND cross slide ways completely sealed.
- One shot lubrication to cross slide ways and internal saddle bearings.
- HARDENED AND GROUND sealed anti-friction vertical slide.
- HARDENED AND GROUND BED WAYS with automatic lubrication.
- 3600/1800 R.P.M. 2 speed wheel head. Heavy alloy steel spindle heat treated, runs in super precision ball bearings accurately preloaded, lifetime lubricated.

Handy control panel.

- Elevation micrometer stop graduated in .0001".
- GROUND THREAD FEED SCREW.
- Automatic wheel TRUING device.
- Longitudinal hand wheel with automatic engagement.
- Hydraulic head movement throttle with rapid traverse.
- Hydraulic table movement throttle.
- Elevating hand wheel graduated in .0005".
- GROUND THREAD FEED SCREW.

WRITE TODAY for complete specifications and performance data. Address Dept. 14 Thompson Grinder Co., Springfield, Ohio.

COPYRIGHT 1951 BY THE THOMPSON GRINDER CO.

➡ The only manufacturer of a complete range of heavy duty and light duty surface and contour grinders for industry.

# Thompson SURFACE Grinders

The Thompson Grinder Company, Springfield, Ohio

# The **Bridgeport** TURRET MILLING MACHINE

**with its NEW 1 H.P. HEAD**  
**provides capacity for**  
**handling a wider range**  
**of heavier work**

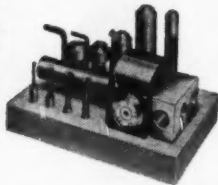
With a record of versatility already established in tool rooms and production lines of countless shops (more than 13,000 machines in service in only 12 years) the new "BRIDGEPORT" 1 H.P. milling, drilling and boring head provides even greater machining possibilities . . . in increased capacity and ability to handle larger work.

Among the features of this machine are: 8 spindle speeds from 80 to 2720 R.P.M. . . . back geared spindle drive unit utilizing full power at all speeds without belt slippage . . . a quill travel of 5" . . . power feed to quill in three steps . . . positive 2-way power feed stop tripping mechanism . . . spindle lock and brake . . . and a collet capacity up to  $\frac{3}{4}$ " diameter.

Investigate the possibilities of the "BRIDGEPORT" on your work . . . send for complete details on the machine and its attachments.



**Right Angle Attachments**  
(Left) Heavy Duty attachment (made in two sizes) applicable to Master as well as 1 H.P. Bridgeport heads.  
(Right) Light Duty type for milling and drilling narrow, deep molds and cavities.



**Milling Machine Vise**  
This improved vise, attractively streamlined, assures greater gripping power provided by a large diameter screw. A coolant trough adds to its utility. Made in two sizes: 5"x  $3\frac{1}{2}$ " and 6"x5" jaw openings.

**No. 2 Boring Head**  
With this attachment, holes up to 6" diameter can be bored. It is applicable to the Bridgeport 1 H.P. Milling, Drilling and Boring Attachment.

## **Bridgeport** MACHINES, INC.

Bridgeport, Connecticut

Manufacturers of High Speed Milling Attachments and Turret Milling Machines

# USE ALLEN COLLETS..



YOU CAN DEPEND  
ON THEM FOR  
ACCURACY  
CONCENTRICITY  
LONGER LIFE  
EASIER TO USE



**MAIL COUPON TODAY!**

**ALLEN COLLET MFG. CO., INC.**  
17720 Claran Ave.  
Melvindale, Michigan

Please send catalog and prices

NAME \_\_\_\_\_  
TITLE \_\_\_\_\_  
COMPANY \_\_\_\_\_  
STREET NO. \_\_\_\_\_  
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

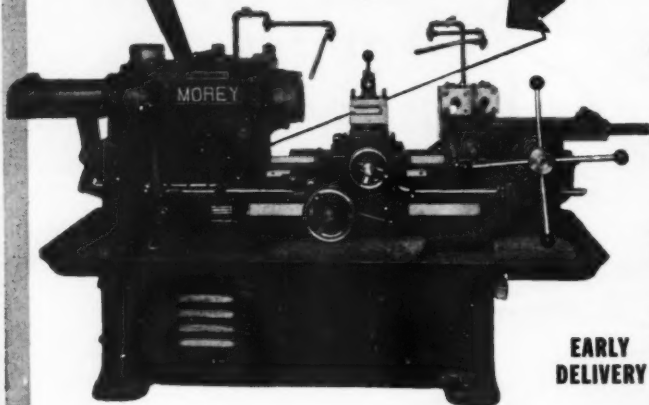
# MOREY TURRET LATHES

for BAR or CHUCKING

UNIVERSAL  
or PLAIN

## #3 UNIVERSAL

For bar stock up to 1 1/2" in diameter  
18" turning length  
18 1/2" swing over bed  
Infinite spindle speeds: 55 to 1800 RPM, constant speed motor, 1200 RPM  
AVAILABLE ALSO WITH PLAIN CROSS SLIDE  
Ask for Circular 727A



EARLY  
DELIVERY

## #2 PLAIN-GEARED

For bar stock up to 1" in diameter  
Turning length 8 1/2"  
Swing over cross slide 6"  
Swing over bed 16"  
Infinite spindle speeds:  
Maximum of 60 RPM  
Constant horsepower on all speeds  
Ask for Circular 528A


## #4 UNIVERSAL


For bar stock up to 1" in diameter  
15" turning length  
18 1/2" swing over bed  
Infinite spindle speeds: 35 to 1800 RPM, constant speed motor, 1200 RPM  
AVAILABLE ALSO WITH PLAIN CROSS SLIDE  
Ask for Circular 728A


DESIGNED AND BUILT BY  
**MOREY MACHINERY CO., INC.**


110 BROOME STREET NEW YORK N.Y. Plant 357 26th AVE. ASTORIA NEW YORK


 INFINITE SPINDLE SPEEDS  
—Electrically Selected—


 DIRECT BELT DRIVE AVAILABLE AT HIGH SPEEDS  
ELIMINATES GEAR MARKS  
(patents applied for).


 GEARED SPINDLE SPEEDS INSTANTLY AVAILABLE THROUGH MULTIPLE DISC CLUTCHES.


 SPINDLE MOUNTED ON TIMKEN BEARINGS.

 RIGID—WITH SUFFICIENT POWER TO TURN AT THE HIGHEST SPEEDS AND FEEDS MODERN TOOLS WILL WITHSTAND.

 SPINDLE SPEEDS AND POWER FEED CHANGES WITHIN EASY REACH OF OPERATOR.


 BED MOUNTED ON CABINET BASE.


 MOTORS AND STARTING EQUIPMENT EASILY ACCESSIBLE.


 HEXAGON TURRET AUTOMATICALLY UNCLAMPED, INDEXED AND CLAMPED.

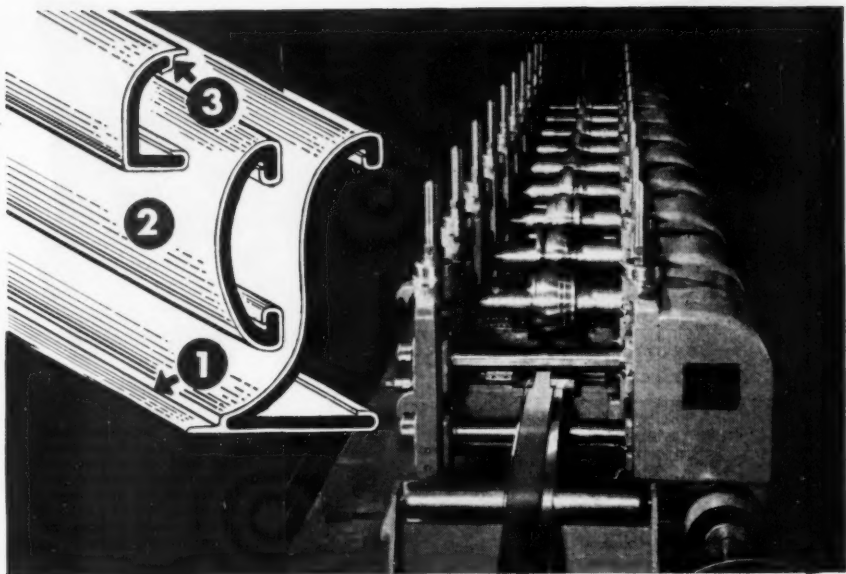
 THREE TYPES OF CROSS SLIDES AVAILABLE:

Lever Feed  
Screw Feed  
Combination Feed\*

 \*Combination feed provides instantaneous selection to either lever or screw feed.

 EIGHT (8) FEED CHANGES FOR THE UNIVERSAL CARRIAGE and HEXAGON TURRET, INSTANTLY ENGAGED OR DISENGAGED BY ONE MOVEMENT OF THE LEVER.

 THE DESIGN OF THE MOREY No. 2, 3 and 4 TURRET LATHES ARE BASICALLY ALIKE. EACH MACHINE IS ENGINEERED FOR THE SIZE WORK IT IS DESIGNED TO HANDLE.



**12**

## EXAMPLES OF ECONOMIES

effected by combining  
different operations  
in a YODER Roll  
Forming Production  
Line

### No. 11. Making Stainless-faced shapes on Carbon Steel Base

One of the ads in this series showed how a new type of telephone cable was covered by aluminum and paper, and the seam sealed by injection of a viscous cement—all in one passage through a Yoder roll forming machine. Another ad showed how welding rod was made by cold forming a tube, filling it with powdered flux, cutting to length and sealing the ends in a Yoder line.

These are quite special examples, but indicative of broad possibilities. An example of more general application is the making of duplex moldings, combining a carbon steel strip (for strength) with a thin covering of stainless or non-ferrous metal, to present a beautiful, rust-resisting wearing surface.

Millions of feet of such moldings are being used annually by manufacturers of metal furniture, electric and other household appliances, food service and automotive equipment. New applications are constantly being found.

Equipment needed consists merely of two coil boxes, a Cold Roll Forming machine and an Automatic Cut-off, all standard Yoder units. As such a line will produce upwards of 30,000 feet per day, with only one operator, the conversion cost per foot is insignificant.

**THE YODER COMPANY • 5509 Walworth Ave., Cleveland 2, Ohio**

#### Complete Production Lines

- ★ COLD-ROLL-FORMING and auxiliary machinery
- ★ GANG SLITTING LINES for Coils and Sheets
- ★ PIPE and TUBE MILLS—cold forming and welding





# Chicago RIVET "912"

## AUTOMATIC RIVET SETTER

### CUTS COSTS 3 WAYS

#### 1 FASTENS FASTER . . .

Only the speed of the operator limits the 912's riveting speed. Completely automatic. A push on the foot pedal automatically feeds, inserts and clinches the rivet.

#### 2 DOES WORK OF SEVERAL MACHINES

Quick change rotary hopper and race-way makes the 912 adjustable in 5 to 10 minutes to set different size rivets. Adjustable anvil height and 12-inch throat provide further versatility.

#### 3 SAVES ON MAINTENANCE . . .

The 912 is massively built to stand the shocks of constant use and is designed for quick, easy servicing and parts replacement.

If your assembly calls for 3/16" steel tubular rivets or smaller, of 3/4" lengths or less, ask us to show you how the 912 can cut your fastening costs. Send a sample of your problem assembly (or blueprint) for a free fastening analysis.



#### FREE CATALOG

contains valuable engineering information and rivet specifications plus illustrated descriptions of 26 Chicago Automatic Rivet Setters.



## Chicago Rivet & MACHINE CO.

9610 West Jackson Boulevard, Bellwood (Chicago Suburb) Illinois

Branch Factory: Tyrone, Pa.

# No cam worries with a Warner & Swasey 5-Spindle Automatic

NO CAMS  
TO DESIGN



NO CAMS  
TO MACHINE



NO CAMS  
TO STORE



NO CAMS  
TO FIND

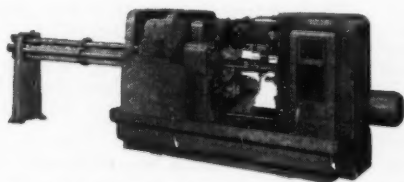


NO CAMS  
TO CHANGE



IT'S SIMPLE TO SET UP

**WARNER  
&  
SWASEY**  
Machine Tools  
Cleveland



*5-Spindle Bar Machines*

—1 3/4" Standard Capacity

—2 3/4" Oversize Capacity

*5-Spindle Chucking Machine—6" Swing*

**IT'S SIMPLER TO SET UP A WARNER & SWASEY CAMLESS AUTOMATIC!**

*today's best buy is better air!*



Type N ROTO-CLONE exhausting this circular saw polishing station and other dust sources at The E. C. Atkins & Co., Indianapolis.

One Battery of five tooth-grinders exhausted by Type D ROTO-CLONE.



## METAL DUST CONTROL for millions of teeth!

### **ROTO-CLONE'S Flexible Unit System Solves Problems for Saw Manufacturer**

No dental clinic has seen as many teeth as they turn out at The E. C. Atkins & Co., Indianapolis. Grinding, polishing and cleaning millions of saw teeth create complex dust problems that are basically a part of all metal working industries, but in this instance . . . are all under one roof.

AAF ROTO-CLONE\* units in replacing a large, old-style central system now provide complete flexibility of dust control at each source, as well as many other advantages. For example: small Type D ROTO-CLONES with viscous after-cleaners allow recirculation of cleaned air from all polishing and dry grinding operations with consequent seasonal heat saving. Also, the Type D's permit rapid re-arrangement of machinery

on production lines with their exhaust ventilation and dust collectors included as an integral part of the equipment.

Where fire is a hazard (as in polishing operations) or for dust sources that produce heavy loadings and fine particle sizes, the Type N ROTO-CLONE wet-collectors are used for their safety and high efficiency.

The complete line of ROTO-CLONES includes many types, sizes and arrangements that meet every metal working or finishing problem. For complete information call your nearby AAF representative or write for Engineering Bulletin No. 270.

\*ROTO-CLONE is the trade-mark (Reg. U. S. Pat. Off.) of the American Air Filter Company, Inc., for various dust collectors of the dynamic precipitator and hydro-static precipitator types.



# American Air Filter

COMPANY, INC.

361 Central Ave., Louisville 8, Kentucky

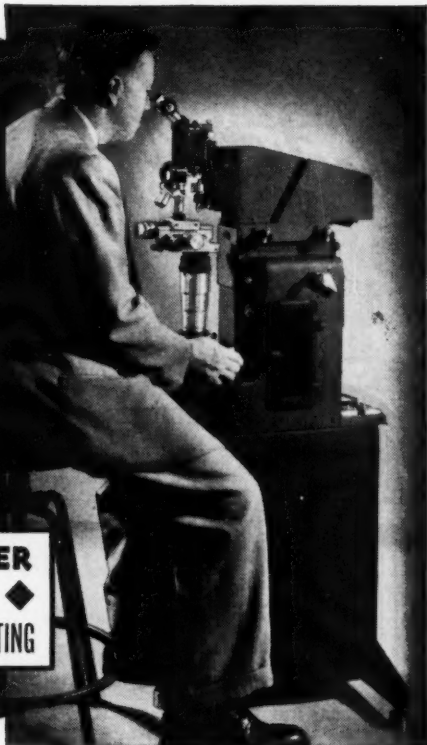
• In Canada: Darling Bros., Ltd., Montreal, P. Q.

# Assured Accuracy with

**TUKON TESTER**

for

**MICROHARDNESS TESTING**



*Researchers and scientists  
accept TUKON's precision and repeated accuracy*

Where minute indentations and extreme accuracy are necessary, the TUKON Microhardness Tester meets the most exacting requirements. A sensitive mechanically or electrically controlled system, with microscopic viewer, is employed.

On hardened steel, length of in-

dentation with 100 gram load is .0016", depth only .00005"; very small metallic crystal areas can be tested. TUKON models are available for testing delicate watch parts to properly prepared specimens of heavy machinery parts. TUKON is necessary in every metallurgical department.

*Information on the correct TUKON Microhardness Tester for your work will be sent on request. Just give us details of the job.*

**ACCO**

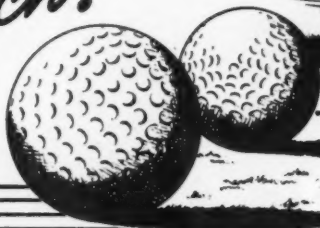


# WILSON

**MECHANICAL INSTRUMENT DIVISION  
AMERICAN CHAIN & CABLE**

230-T Park Avenue, New York 17, N. Y.

*Stymied by a  
fraction of  
an inch?*



**AMES**

## **THERE IS AN AMES INDICATOR OR GAUGE FOR VIRTUALLY EVERY MEASURING PROBLEM**

Today increased production is the keynote of the nation's industrial plants. Outmoded inspection methods slow down the effort. Perhaps Ames can assist you. Ames full line of micrometer dial indicators and micrometer dial gauges plus their unequalled design and engineering ability, offers you the solution to practically any measuring problem controlling quality of process or product you may have. Ames experience includes the successful solution of out-of-the-ordinary problems such as the checking of chatter in grinding, the thickness of potato chips, the stretch of bolts as well as the everyday quality control problems of industry. Call on Ames today—the service is yours for the asking. Don't let production be stalled by outmoded inspection methods.

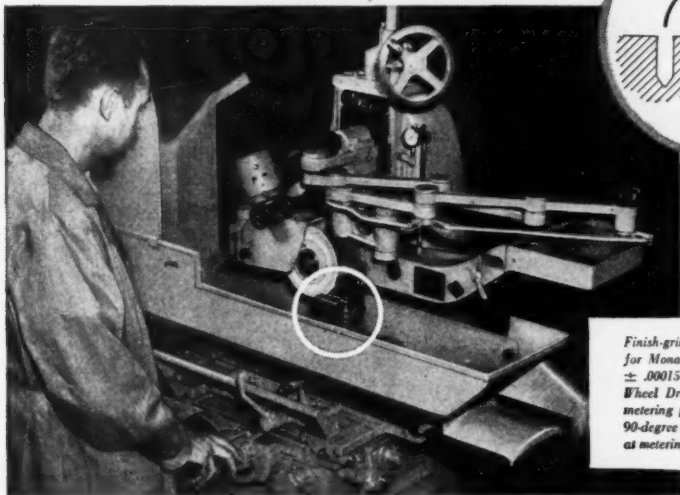
*Representatives in  
principal cities.*

**B. C. AMES CO.**

*28 Ames Street  
Waltham 54, Mass.*

**Mfg. of Micrometer Dial Gauges • Micrometer Dial Indicators**

# Moore Wheel Dresser Keeps Monarch Air Gage Tracer Part within $\pm .00015$ "



*Finish-grinding the valve sleeve (inset) for Monarch Air Gage Tracer within  $\pm .00015$ " using Moore Panto-Crush Wheel Dresser. Sketch shows ground metering ports located on each end... 90-degree included angle, .0001" radius at metering point.*

1951's machine tools produce with unprecedented speed and accuracy because advanced tools fabricate their complex new operating features.

Take tracer-controlled duplication machining, pioneered by the Monarch Machine Tool Co. of Sidney, Ohio. Every component of the Air Gage tracer hydraulic valve for Monarch lathes is completed to tolerances ranging from .0001" to .0003" in what Monarch employees call their "Tenths Room."

An important part of this room is the Moore Panto-Crush Wheel Dresser\*. Mounted on a surface grinder, it makes possible the finish-grinding of the metering ports on each end of the valve sleeve. These ports have a 90-degree

\*Another is a Moore Jig Borer.

included angle with a ten-thousandths radius at the metering point. Depth must be held to plus or minus .00015".

No other method could accomplish this as quickly and accurately as the Panto-Crush Wheel Dresser. This unit combines crush-forming and diamond dressing. Either method is immediately available. Switching from one to another disturbs neither the work-setting nor the location of either truing device with respect to the wheel or workpiece.

Ask for literature describing the device in detail, including reprints of articles appearing in technical magazines.

**MOORE SPECIAL TOOL COMPANY, INC.**  
728 UNION AVENUE, BRIDGEPORT 7, CONNECTICUT

## ADD TO YOUR TOOLROOM

JIG BORERS - JIG GRINDERS - PANTO-CRUSH WHEEL DRESSERS - DIE FLIPPERS - MOTORIZED CENTERS - HOLE LOCATION ACCESSORIES



**SIX SPINDLE  
PRE-SELECTIVE SPINDLE SPEEDS  
TURRET TYPE AUTOMATIC INDEXING  
DRILLING AND TAPPING MACHINE**

*... gives you*

**6 MACHINES  
IN ONE**

**THE NEW No. 2 MODEL A**

**Burgmaster**

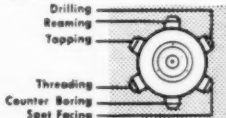
*Designed for ...*

**HIGHER PRODUCTION WITH GREATER  
ACCURACY AT LOWER COST  
PER PIECE MACHINED**

The No. 2 Model A BURGMASER will definitely cut your second operation costs because: Loss of time due to movements of parts from one spindle to another are eliminated; Close tolerances on size and concentricity are easily maintained; Set-up is simple and fast—unskilled operators can run the machine; Less floor space and power required; Rigidity, power and spindle speeds permit the use of high cutting speeds; Fixture costs can be reduced—fixtures can be materially simplified; All this means more parts per hour—per man, at less cost to you.

- ★  $\frac{1}{4}$ " Drill Capacity
- ★  $\frac{1}{2}$ " Tap Capacity
- ★ 1 to 2 H.P., 2 speed, 3 phase, 60 cycle Motor
- ★ 12 Spindle Speeds, ranging from 225-3000 R.P.M.
- ★ 4 Speeds, pre-selective per spindle, at any one setting
- ★ 8" Ram Feed
- ★ 19" Table Travel
- ★ Throat Depth—11-5/16"
- ★ Spindles Mounted on Class "O" Timken Bearings

- ★ Power Index, utilizing Geneva Mechanism
- ★ Individual Depth Stops
- ★ Completely Enclosed Gear Box
- ★ Table work surface—17"x33"
- ★ Approximate weight—1500 lbs.
- ★ Floor space required—36"x36"
- ★ Extremely close tolerance can be held



Write today for  
detailed information.

**BURG TOOL MANUFACTURING CO. DEPT. BB5**

**3743 DURANGO AVENUE • LOS ANGELES 34, CALIFORNIA**

## SKINNER POWER CHUCKS

Skinner has a complete line of models for heavy duty production work on engine and turret lathes and automatic machines. Sizes from 6" to 21" with forged steel bodies, and with either 2 or 3 adjustable or non-adjustable jaws are available. The wedge angle is such that work is gripped positively, either internally or externally, regardless of jaw position. The chuck will not release the work, even if air line is broken, until operator actuates draw bar.



## SKINNER AIR CYLINDERS

Skinner double acting rotating or non-rotating air cylinders, for operating power chucks and fixtures, use a minimum amount of air. Large air ports give quick piston movement. Bronze piston packing spacer reduces friction and insures piston alignment and support. All packings are adjusted automatically by the pressure of the air against the flanges of the packings. Available for 6" to 21" dia. power chucks.



## SKINNER ACCESSORIES

Skinner power chucking accessories include: hand operating valve which is self-sealing and easy operating regardless of position — complete air unit including regulating valve, pressure gage and lubricator—filter to remove all impurities, scale, etc. from the air line — soft blank top jaws — draw bars — draw tubes, etc.

Write for catalog giving complete details on the Skinner line of power and manually operated chucks.

**THE  
SKINNER  
CHUCK CO.**

**341 Church Street, New Britain, Conn.**



*Sold by leading  
distributors in every  
industrial area*



THE CREST OF QUALITY



# Chicago

## WHEEL...

Here ... at Chicago Wheel—is your "One-Stop" Headquarters for everything you need in abrasive specialties. Whether it's Mounted Wheels, Cut-Off Wheels or Grinding Wheels—or all three—you're sure of top-quality products ... backed by over half a century of specialized experience.

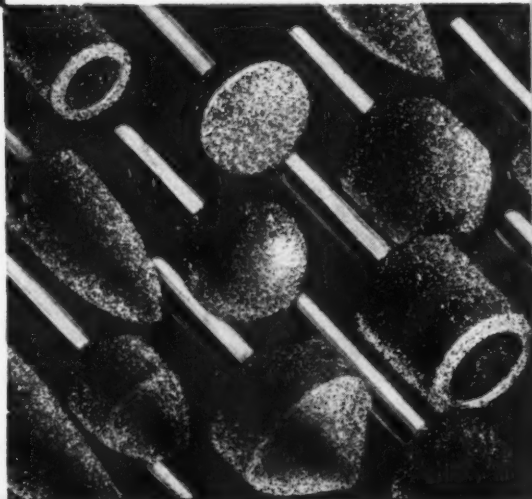


...TIME  
SAVING  
SERVICE

Chicago Wheel is geared to give you the *fastest possible service*. For better quality, too, it will pay you to **look to Chicago Wheel!**

made  
only by...

Offices and Stocks in  
Principal Industrial Centers.

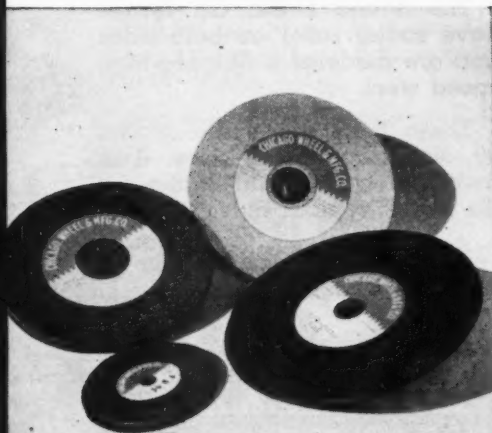
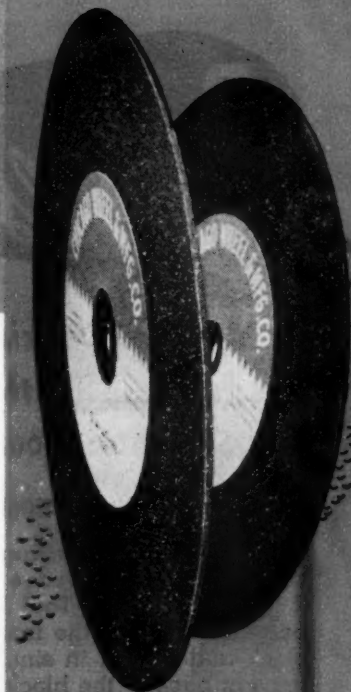


### CHICAGO WHEEL & MFG. CO.

# "One-Stop" Headquarters

- ★ FOR MOUNTED WHEELS
- ★ CUT-OFF WHEELS
- ★ GRINDING WHEELS

● Moisture-Free Cut-Off Wheels — another Chicago Wheel "Exclusive" — stay Factory-Fresh until used ... give you money-saving extra performance.



## Free

Valuable Booklets  
Miniature Sample  
Cut-Off Wheel  
in New  
Moisture-Proof Package



### CHICAGO WHEEL & MFG. CO.

DEPT. M7

1101 West Monroe Street, Chicago 7, Illinois

Please send us the following:

- ☐ FREE New 64-page Catalog
- ☐ FREE Sample Cut-Off Wheel
- ☐ "Safe Speeds For Grinding Wheels"
- ☐ "Portable Grinding Machines"

Name .....

Firm .....

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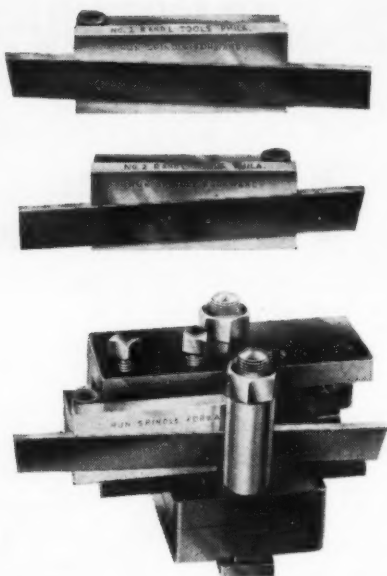


**Are You Making  
Full Use of the**

**R & L UNIVERSAL TOOL POST  
and  
CUT OFF BLADE HOLDER**

Note that all adjusting screws and the taper wedge on the R and L Universal Tool Post can be removed from the front of the block and placed in similar positions in back of the block making it adaptable to both front and back cross slides. The raising block can be removed when necessary to get proper height to the spindle. Additional clamping qualities are obtained by the use of two T-Bolts.

The R and L Universal Tool Post is very useful in holding square cutters, flat form tools, skiving tools and the R and L Cut Off Blade Holders. These Blade



Holders allow for cutting off right at the collet and for an easy, accurate setting after regrinding.

The R and L Cut Off Blades have radial relief on both sides and are made of a durable high speed steel.

These tools are made in No. 00, No. 1 and No. 2 sizes. Also available are Cut Off Blades for the B & S vertical slide.

*Send for your copy of our  
28 page catalog.*

# R AND L TOOLS

1825 BRISTOL ST., PHILA., PA.

TURNING TOOL—UNIVERSAL TOOL POST—FLOATING DRILL HOLDER—CARBIDE AND  
ROLLER BACKRESTS—REVOLVING STOCK STOP—TAP AND DIE HOLDER—CUT-OFF BLADE  
HOLDER—TURRET BACKREST HOLDER—RELEASING ACORN DIE HOLDER—KNURLING  
TOOL—RECESSING TOOL

# VARIA

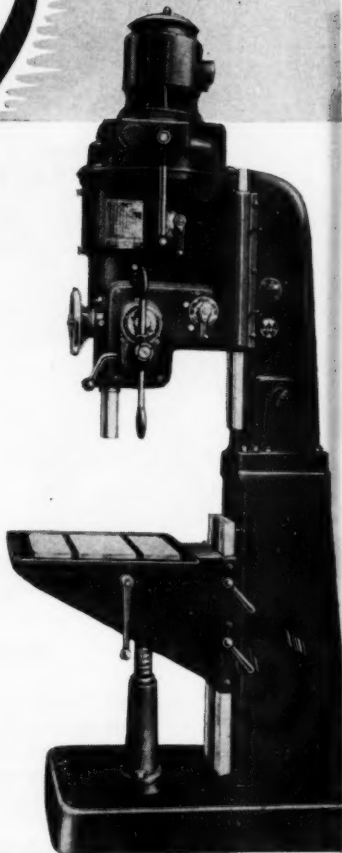
## Transmission Equipped HIGH SPEED DRILLING MACHINES

Good delivery is available on the internationally known WEBO line of High Speed Drilling Machines. Quality produced by expert craftsmen, these drilling machines can speed your production during the present preparedness period and in the competitive days which are ahead. These modern WEBO heavy duty drill presses are equipped with "Varia" transmissions which permit an infinite variation of spindle speed without pulleys or belts. Easy to set and simple in operation. Safety features are built into WEBO equipment . . . multiple spindles can be furnished . . . depth gauge with dial indicator and automatic release.

Full specifications and illustrations on the WEBO line of drilling machines is yours for the asking. Send your request for information today and state capacities wanted . . . you'll be certain that WEBO is the equipment you need today AND tomorrow!



**KLINGELHOFER**  
**MACHINE TOOL COMPANY**  
WESTFIELD, N. J.



**KLINGELHOFER MACHINE TOOL CO.**  
Westfield • New Jersey

Name..... Title.....  
Company.....  
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make your **PUNCH PRESSES**

*Automatic*

**It's Easy...with WITTEK  
Roll Feeds and Reel Stands**

Wittek Roll Feeds handle any type of coiled strip stock and are made in single roll, double roll, and compound types with straighteners, in models to feed in any of four directions. They are reliable and accurate with simple, quick adjustment of feed length. Standard sizes and models meet a wide variety of press size and capacity conditions.

Wittek Reel Stands facilitate handling coiled stock.

*Write for full particulars*

**WITTEK** Manufacturing Co.  
4321 W. 24th Place, Chicago 23, Illinois





## 3-LB. ROTOR SCALER CLEANS WELDS FASTER

**"PAID OFF"  
IN 25 DAYS**

Report from a fabricating shop: The new Rotor S-1 Scaler cleans more welds per day because it is lighter, shorter, easier to get into hard-to-reach places. Man-hour savings paid off the cost in 25 days.

Facts: The Rotor S-1 weighs only 3 pounds; is 10 inches long. Safety retainer chisel allows long reach into corners—you don't have to hold chisel. Operator can control the blow to suit the work. For peening, rust and scale removal, star drilling, light chipping.

Ask for free copy of Bulletin 33 that gives complete details and shows various shapes of chisels and star drills that can be used.

**AIR O'TOOL**



THE **ROTOR TOOL** CO.

CLEVELAND, OHIO



# CUT COSTS

## BY CUTTING

*faster*

With a  
**STONE**  
**Swing-Cut M14**



A Low-Cost Metal Cut-Off Machine That Performs Production Cutting Of Ferrous and Non-Ferrous Solids Up to 1½" — Pipe and Structurals Up to 2½" At the Rate of—

**4 SECONDS**  
**PER SQUARE INCH**  
And May Be Used For Miscellaneous Cutting of 2" Solids (15 seconds).

**Swing-Cut M14 Speeds Up Cutting Operations—Prevents Bottlenecks**

- cuts faster, cleaner with positive drive
- swivels up to 45° in either direction
- 32" x 34" bench model — app. weight 300 lbs.
- designed for flexibility — easy, safe operation

### CUTTING DATA

Material	Size	Time per Cut
COLD ROLLED STEEL — Bar Stock	1" x 1½"	6 sec.
HIGH SPEED STEEL — Bar Stock	1" x 1"	4 sec.
PIPE — Heavy Steel	2½" O.D. — ¼" Wall	10 sec.
TUBING — Stainless Steel	1½" O.D. — ⅛" Wall	2 sec.
STRUCTURAL — Angle Iron	2" x 2" x ¼"	5 sec.
ALUMINUM — Bar Stock	1" x 1½"	3 sec.
BRASS — Pipe	1½" O.D.	3 sec.
COPPER — Bar Stock	1" x 1½"	5 sec.

Swing-Cut M14 asks little — gives a lot! Available at a lower price than any other machine of its capacity, this rugged little brute requires only 9 square feet of bench space to perform fast, clean, low-cost abrasive cutting. Engineered with positive drive without the use of belts (an exclusive Stone feature), the Swing-Cut M14 full 3½ h.p. geared-in-head motor delivers maximum constant power — increasing cutting speed, affording greatest efficiency and insuring longer wheel life.

Write for Further Information

## STONE MACHINERY CO., INC.

304 Fayette St.

Manlius, N. Y.

# **HY-PRO TAPS**



## MADE IN A MODERN, PRECISION PLANT

HY-PRO Taps are produced in a large, modern plant completely equipped with modern, precision machines and facilities. In this plant there is no out-moded, weak-link equipment to disrupt strict production schedules, or imperil high standards of quality.

Specialized technical know-how, skilled workmanship and the latest precision equipment combine to produce the finest threading tools available to the metalworking industry.

High Production — as the name HY-PRO implies — is maintained on the toughest tapping jobs as proved by many of America's largest tap users who specify HY-PRO Taps for extra stamina and sustained accuracy.

Select your requirements from the full line of High Speed Steel Ground Thread Taps stocked for your convenience by Hy-Pro Distributors. Specials made on order.



**COMMERCIAL • PRECISION  
SPECIAL  
GROUND THREAD TAPS**

*Order Thru Your*



*Distributor*

**A Subsidiary of  
Continental Screw Co.**

**TOOL CO.**

**New Bedford  
Mass., U. S. A.**

# MARK IT FOR MARKET!



**CLEAN ... LEGIBLE ... PERMANENT ...**

MODEL  
175  
HYDRAULIC



Identification **ROLLED** into your products will help you market them.

Hack Saw blade above has been permanently marked in a Model 175 Hydraulic Marking Machine using a solid engraved lettering knurl.

Your name, model number, part number, serial number or decorative designs can be rolled into your components to improve their appearance and facilitate identification.

Send prints of parts, showing required marking and its location on part with hourly production for free recommendation.

WRITE FOR CATALOG



**GEO. T. SCHMIDT, INC.**

1802 W. BELLE PLAINE AVENUE  
CHICAGO • 13 • ILLINOIS

120 to 150 pcs. per min.

# Automatic Thread Roller

Completely Automatic Feed

Filtered Lubrication

Table Top Working Level

Vibration Free Operation

Quick, Easy Set-ups

Class 3 Fits

diam. from .086" to .190"  
thread lengths from 1/8" to 1 1/2"

WRITE FOR BULLETIN NOW!

**HARTFORD**

*Special*

...the best buy in the long run

THE HARTFORD SPECIAL MACHINERY CO.  
287 Homestead Ave., Hartford 12, Conn.

Please send me free Bulletin TR-100 describing your Automatic Thread Roller.

Name  Pos.

Company

Address

City  Zone  State

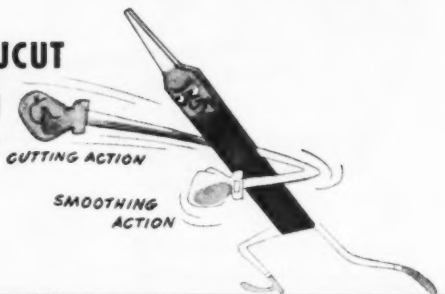




# HELLER

## NUCUT WAVY TEETH FILE

Only a NUCUT  
gives you  
"one-two"  
filing



1. CUTTING ACTION
2. SMOOTHING ACTION

*At every stroke*

Here's another superiority of the NUCUT "Wavy-Teeth" design. This patented feature provides the file with two sets of teeth—both in the same cutting plane. One set, the coarse teeth, cuts deep, clean, true. The other set, the fine teeth, leaves the surface smooth. Both cutting actions take place at the same time—just as if two files were working instead of one.

Your industrial distributor will gladly tell you what NUCUT "Wavy-Tooth" filing can mean to you in the way of faster cutting and smoother finishing at lower cost. He will also suggest sizes, shapes, cuts that will meet your needs best.

### HELLER BROTHERS COMPANY

*America's Oldest File Manufacturer*

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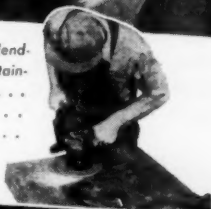
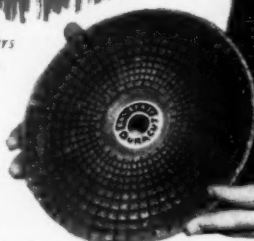
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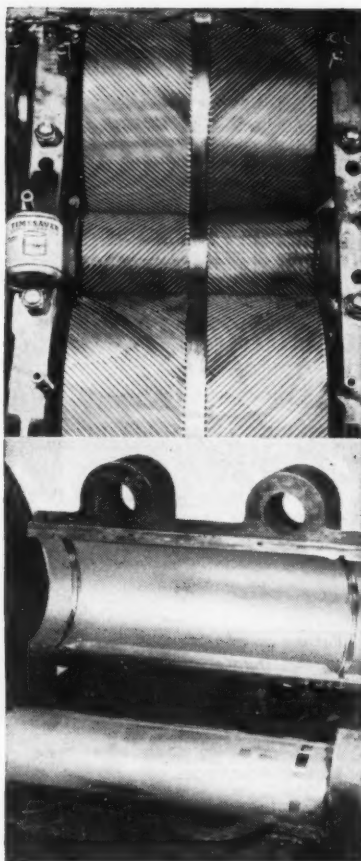
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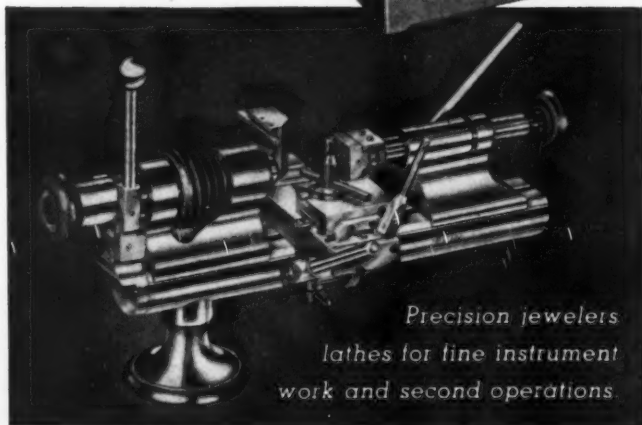
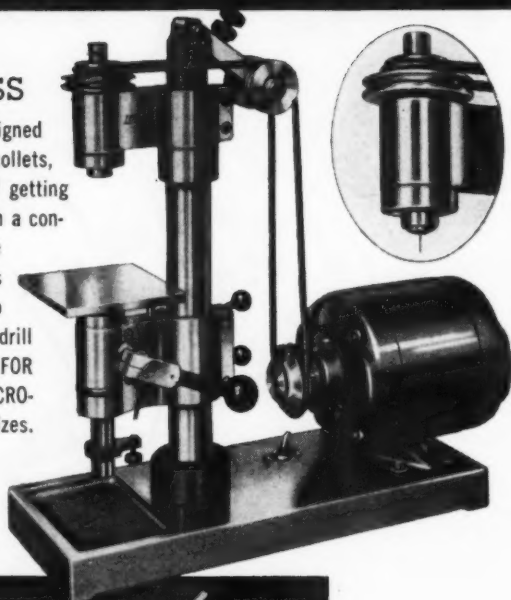
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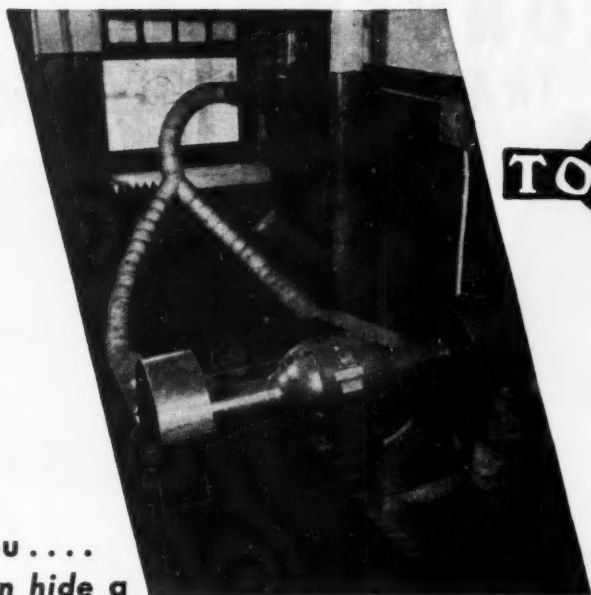
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TOOL HOLDER

After two years of research and actual running on high production jobs "Multicut" tool holders are still the newest design in industry today.

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*Write Today for Bulletin No. 511*

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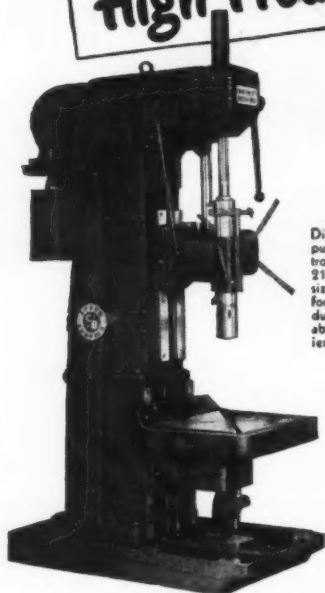
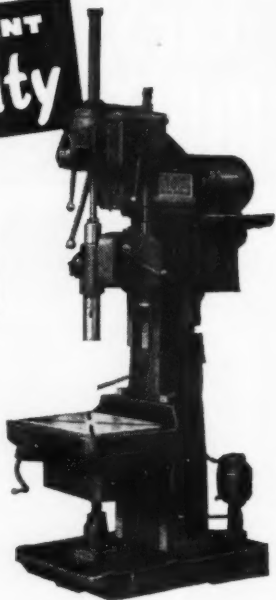
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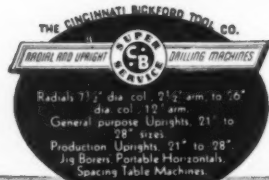


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**THE CINCINNATI BICKFORD TOOL CO.** Cincinnati 9, Ohio U.S.A.

JUNE, 1951

MTBB

AS THE EDITOR SEES IT • AS THE EDITOR SEES IT • AS

**Not a hunting license,  
but a cashier's check**

... that's how the Department of Commerce sums up the new CMP (Controlled Materials Plan) effective July 1, 1951. With CMP, NPA will tell producers what the government needs; it will furnish the timetable for getting things done; and will give producers the authority to carry out the program. This authority is expressed in terms of authorized production schedules to obtain and use controlled materials and a preference rating on other materials and components needed to complete the job. This authorization for materials is not a hunting license, but a cashier's check.

Under CMP, manufacturers producing materials for the defense program, or for making goods in support of defense program, will receive all the materials needed.

Manufacturers will be a hunting license; i.e., they'll have to scramble for such steel, copper, and aluminum that's left. And a mad, rough scramble it'll be!

Present CMP follows closely the pattern of World War II plan, except that during the last war everybody was affected whereas today some manufacturers will be left out and they will endeavor, with the help of good Dame Fortune, to uphold

the civilian economy as best they may.

Unquestionably, CMP will cause dissatisfaction, increase paper work and put manufacturers of civilian products in a tight squeeze. They will be unable to adhere to profitable production schedules and as a result their labor force will also be in a constant state of flux. There will be headaches ahead!

As this nation girds for defense, while trying to maintain a civilian economy, orders are mounted upon regulations, directives are piled on decrees, and the whole business interlocked with administrative agencies also heaped one on top of the other. One might well ask, child-like: what does the military hierarchy do during peace-time? Shouldn't plans have been laid so that, in the event of mobilization, industry would fall into the general pattern? Shouldn't somebody have spent part of the peace years in preparing and planning?

At any rate, in spite of the alphabet and the jungle jims thrashing in the Washington jungle, industry will get the job done ... and that's no mean accomplishment!

*William F. Schleicher*

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**Roller Dies  
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**203 Pannier Bldg.**

**Pittsburgh 12, Pa.**

# FEATURED IN THIS ISSUE • FEATURED IN THIS ISSUE • FE

<b>Solution to tapping problems .....</b>	<b>121</b>
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**Washington news letter by Arnold Kruck-**  
**Man. Page .....**109

**How's business? Page.....**115

**If you break only a tap a day . . . you**  
**haven't licked your tapping problems, by**  
**Harry Conn.** More care is expended on the  
manufacturing of taps than in the using  
of them. There is no reason why taps  
should break if proper tapping procedures  
are followed. Some of the reasons for tap  
failures and solutions to these tap failures  
are analyzed by the author. Page.....121

**Professor Reichardt's quizzes. Page** 125-156

**You can reduce wheel and grinding costs**  
**with atomized spray grinding, by H. J.**  
**Chamberland.** When grinding surface to  
precision flatness the coolant used is  
important. Conventional, or recirculating  
method of cooling is sometimes ineffective  
because wind caused by the whirling  
wheel blows the coolant away from the  
work in advance of the wheel. With atom-  
ized spray grinding the coolant is led  
through the wheel and thus unto the work,  
eliminating the danger of the wheel blow-  
ing the coolant away. Page .....

**Use of compressed air speeds production**  
**of die cast parts.** The use of air attach-  
ments to blow away chips, clamp and  
unclamp work, feed, clean, etc. is a con-  
tributing factor in high production rates on  
die cast parts. The skillful use of air can  
lead to savings in manpower and reductions  
in manufacturing costs. A detailed  
analysis of how one manufacturer of die  
cast parts handles compressed air is de-  
tailed in this article, prepared for the Blue  
Book by the Compressed Air and Gas In-  
stitute. Page .....

**Increase life of hydraulic units for machine**  
**tools through care and service, by J.**  
**Howard Groom.** Expensive down-time due  
to the failure of hydraulic mechanisms can  
be avoided through proper care and serv-  
ice. Some of the common reasons for fail-  
ures are discussed by the author, as well  
as some of the preventive measures which  
can guard against trouble. Page.....171

**Shop hints. Page .....**187

**To get most out of women workers . . .**  
**understand their five basic desires, by**  
**Edmund Mottershead.** In this month's Fore-  
manship Forum, Mr. Mottershead discusses  
the basic urges, or drives, which distinguish  
women workers from men workers. A close  
study of these fundamental desires should  
do much to improve relations between  
management and women workers. A sound  
relationship must exist today in view of  
the increasing numbers of women workers  
who will enter industrial employment dur-  
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Gage Block Set 35A.  
Larger or smaller sets, and  
individual blocks, are also  
available.  
Below: Set of Tungsten  
Carbide Wear Blocks.

## NO FINER GAGE BLOCKS ARE MADE Anywhere in the World



**A strong statement — but fact!** Taft-Peirce Gage Blocks are made from the finest alloy steel, carefully hardened and seasoned. Surfaces lapped to the highest degree of flatness and finish insure the ultimate in accuracy and durability. Dimensions, clearly marked on the edges, are always visible when in use — a Taft-Peirce exclusive.

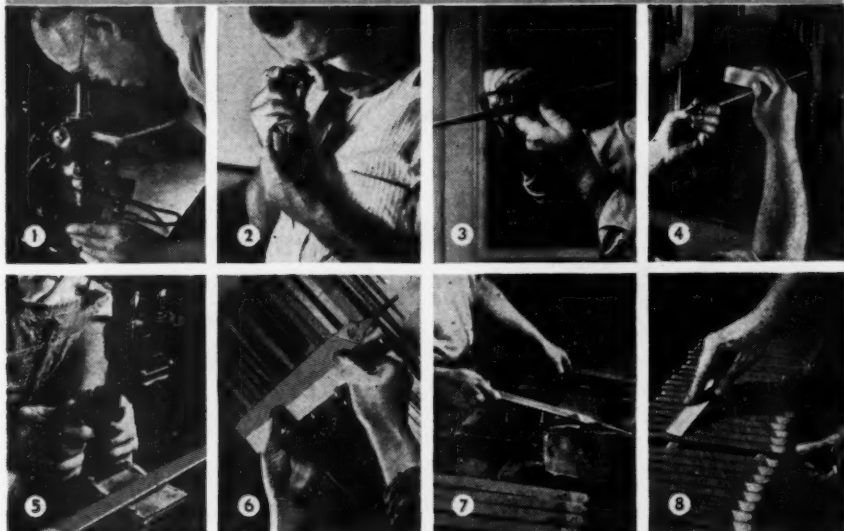
The 35A Gage Block Set permits all dimensions from .300" to 8.000" in steps of .0001" to be obtained—a truly economical set! For a wider range, the 82A Set, consisting of 81 blocks and an extra, measuring .10005", provides all dimensions from .200" to 12.000" in steps of .0001" and from .300" to 12.000" in steps of .00005". Tungsten Carbide Wear Blocks, measuring .050" and .100", are also available to increase the life of any gage block set. Write for more information today.

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- 1 Checking grain structure of steel to assure proper heat treatment.
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- 5 Inspecting file teeth with microscope.
- 6 Checking edge of mill file for proper taper.
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From the inspection of each batch of Nicholson-specified steel to the final packaging, every basic step of the manufacture of Nicholson and Black Diamond files is subjected to rigid controls, checks and tests. A few are shown here.

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a file for every purpose

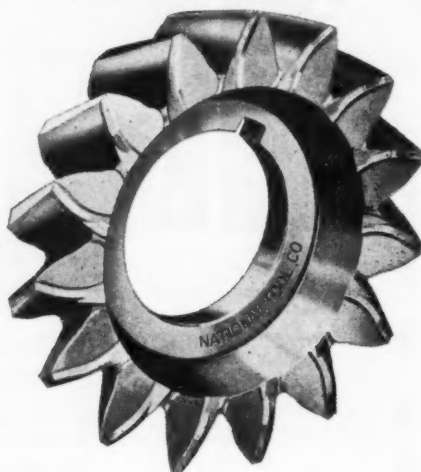
For those tough *Special* jobs that  
just have to be right...depend on

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HERRINGBONE GEAR CUTTER**  
custom-engineered to  
meet the exacting needs  
of the Gear Industry

*Since 1905* engineers  
and manufacturers of high-  
quality special cutting tools  
for the metal-working industry



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*special* tools  
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manufactured by  
National Tool Company



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Flat Form Tools

## LAST MINUTE WASHINGTON NEWS

by Arnold Kruckman

Washington Correspondent



JUNE, 1951

Orders received by mach. tool blds. in the 7 months since June, '50, were more than 3 times the total received the first half of '50. In Jan. '51, orders were highest since mid-'42. Some dollar rise is attributable to advance in prices since June. Shipments not keeping up with incoming business, backlogs are at highest point since war started, 20 months unfilled orders. "Pool order plan" should enable builders to plan advance scheduling of production on defense orders & to obtain raw materials as required.

Get information re: "pool orders" for machine tools from General Services Administration, Office of Public Information and Reports, GSC Bldg., 18th & F St., N. W. Telephone Executive 4900, ext. 4511. To reach administrator Jess Larson, tel. Executive 4900, ext. 4312. All standard items bought by Commissioner Clifton E. Mack, 7th & D St., S. W., room 3143, GSC Bldg., tel. Executive 4900, ext. 5268. Capt. H. C. Maull, Jr., is Acting Dir. of Emergency Purchases. Room 3002 at 7th & D St., S. W., tel. District 5700, ext. 2672.

Net income after taxes, in '50, of corps. and firms making machy., tools, hardware, etc., totaled about \$500 million. Tools & hardware income, \$56,659,000, increase of 65% over '49; Machy. \$218,140,000, increase of 20%. Other metal products, \$213,388,000, increase of 50%.

Defense contract awards are running at the rate of \$1,250,000,000 per week. These are contract awards, not disbursement of funds. Tooling up, etc., expected to delay production until fall....SEC & Dept. of Comm. report new plants and equipment expenditures in '51 will reach \$24 billion, 29% more than in '50, 24% above '48 which was the peak.

Administrative vacuum exists in Washington, not politically, but realistically. Impossible to get exact stable information. For instance, the Gov't. wanted an assistant supervisor for machine shops. A candidate went before Civil Service for exam. The quiz was an IQ test, no one said a word about machine shops.....Leslie J. Carson, of Link Belt is Dir. of Machy. Div., OPS. Machine Tool section has no chief. Roger Magoun is in charge; but he wants to quit soon as possible. No one knows who will handle job....For information about the subject, get in

touch with Bainbridge Crist, charge of information on industrial subjects. He is in Tempo E, 7th wing, first floor, 4th & Adams Dr., S. W. Tel. Sterling 4200, ext. 5730.



Over 85% steel will be diverted from civilian uses, beginning the third quarter, nameless NPA authorities declare. Military will use 21%; 30% on rated orders; 30% on B list of CMP program. Data about steel production conflicts. One source in the Gov't. claims we'll have 80,000,000 tons; another claims 120,000,000 tons..... By end of this year it is forecast civilians will have only somewhere between 30% and 40% of basic metals..... Office of Technical Services, U. S. Dept. of Comm., can tell you how to use bamboo for steel in reinforced concrete.

CMP program almost exactly as it functioned during the war, is to be put into operation July 1. Defense Mobilizer Wilson is not enthusiastic, but goes along. He thinks it will necessitate huge increase in personnel, and increase difficulties of industry.

U. S. Dept. Labor is recruiting skilled workers in Germany & Austria, particularly tool makers, die sinkers, & setters, & skilled machine operators.....

Decline in man-hour per unit in production of standard machine tools is attributed to increased efficiency, both direct & indirect labor. Man-hours were down 2½%. Direct man-hours per unit were 2½% less while indirect was 1½% less. Drilling machines & lathe groups were hardest hit by the decline. Indirect labor requirements increased appreciably for upright and radial drills, engine lathes, & automatic screw machines. Producers of boring machines & grinding machines (except tool & cutter grinders) experienced favorable indirect man-hour trends as the market improved in '49. Reciprocating table surface grinders showed an approximate 20% increase in output; internal cylindrical grinders gained about 10%. Value of output increased for boring machines, though productivity dropped slightly in number. Complete data available from U. S. Dept. Labor, Bureau of Labor Statistics, Special Series #4.

Essential activities list which serves as a guide for military service, issued by Dept. Comm. was cut down from 75 groups to 25. List includes production of machy. & equipt.; machinists precision tools; abrasives & cutting tools; anti-friction bearings; construction machy. & equipt.; precision testing, recording, controlling, timing & measuring instruments, valves & meters; & other machy.; machines, tools and equipt.

U. S., Britain, Netherlands, & Belgium, conferred two days but could

# 2

## DUMORE DRILL HEADS

cut multiple-drill holes in bulk



### for Omco Products Corporation

#### PROBLEM

... only 20 holes per hour...  
... drilling 2 holes in a round...  
... cylinder each hour...  
... was a factor in the...  
... multiple drill head...

#### SOLUTION

... Dumore drill heads...  
... \$10.00 to \$20.00 per hour...  
... the set-up...  
... Dumore head...  
... was...  
... Dumore head...

DDM-7

**W**ould you pay \$200 to save \$5,000 a year . . . \$400 to save \$10,000? Sure you would. And that's the kind of savings users of small drills report that they are getting with the new Dumore Automatic Drill Head.

We can't tell you how much this revolutionary tool will save you, because we don't know your problems. You'll have to figure the savings for yourself. That's why we're urging you to write for the facts Today!

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## TO THE DESIGNERS AND THE MAKERS OF TOOLS AND DIES AND PARTS

Have you considered the advantages of a single grade of ready-for-use oil hardening tool steel for ALL your requirements—flats and squares as well as rounds?

In rounds, for many years now, you have used and liked **Warplis** Drill Rods . . . the accuracy and uniformity, the flawless finish, the ease of working, the safe hardening and the non-warping characteristics . . . the excellent performance of the finished tools and dies and parts.

Now you may have the same fine grade in **Warplis** Precision Ground Flat Stock . . . flawlessly finished flats and squares, accurate, truly square, free of decarb . . . each piece indelibly marked with size and grade, each in its own protective wrapper.

The steel in both products is cold melt electric furnace tool steel of this well known analysis:

Carbon.....	.90	Manganese.....	1.10
Chromium.....	.50	Tungsten.....	.50
Vanadium.....	.15		

There's a wide range of stock sizes for your convenience . . . rounds from  $\frac{1}{32}$ " to  $1\frac{1}{2}$ " in thirty-six inch lengths . . . squares from  $\frac{1}{8}$ " to 3" . . . flats  $\frac{1}{64}$ " to  $1\frac{1}{2}$ " thick by widths up to 12" in eighteen inch lengths.

**WARPLIS** products in standard sizes and lengths are obtainable off the shelves of fine steel distributors from Coast to Coast. We would like to send you stock size and price folders and, if desired, the name of the distributor nearest you.

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**MONACA, PA.**

*Since 1902 . . . makers of drill rods and other cold finished fine steels in all sizes, grades and shapes.*

## LAST MINUTE WASHINGTON NEWS, JUNE, 1951

find no formula to reduce price of tin. RFC, only authorized importer, quit buying. Price quickly tumbled in world markets. Indonesian Ambassador, acting for Britain, Netherlands, & Belgium, as well as for his own Malaysian Govt. complained bitterly to the State Dept. ECA, as well as State Department, seized the opportunity to warn Marshall Plan beneficiaries to stop pushing up prices of materials we buy from them for our stockpile. Congress let it be known it would dry up the funds if ECA's foreign clients hold us up..... Aluminum is reported so abundant that sellers are peddling their wares even in Washington; but from various parts of the country women complain vociferously they can't get pots and pans but are offered plenty aluminum cocktail shakers. Meanwhile, U. S. Govt. refuses any commitment to purchase the billion pounds annually offered 5 yrs. from now by the Aluminum Co. of Canada, to be produced in the proposed \$500,000,000 plant to be built 400 miles North of Seattle in British Columbia. Senator Murray, (D.Mont.) says it would glut the market; but Canadian Trade Minister C.D. Howe insists U.S. funds will be provided to build the plant.



Business people who wish the latest authentic information on the defense program can have it brought right to their town. Ask your Senator or Congressman to initiate the arrangements. Any local meeting sponsored by responsible citizens, will bring high echelon officials from Wash., representing Senate Small Business Committee, the House Small Business Committee, Munitions Board, ECA., NPA., DMA., ECA., & FSA. The program covers one day. A Decontrol Commission, under discussion, may drastically modify the Defense law which expires 30 June. Congress feels all the controls aren't properly administered. If our forces do not suffer mat'l. reverses at the hands of 700,000 fresh Chinese Communist troops in Korea over the line of Manchuria; & if prices continue to soften, the Defense laws may not be renewed. Maj. Gen. Wm. Henry Harrison wants to retire as hd. of DPA because of ill health. Gen. Clay already has retired to take pressure off Wilson. It is generally Washington opinion that Wilson's position will become untenable & that he will retire. Principals & substantial elements, in and out of Wash. wish decontrol. Those brought to the various agencies in the lower echelons, & those employed to do business with them, on behalf of various elements in the economy, hope the Defense organizations will be perpetuated. The joint Senate-House Committee on Defense Production will hold hearings starting 1 May & lasting practically through the month, to determine to what extent the law should be modified, or possibly entirely wiped out.

# "ALL OUR MONEY BACK IN 62 DAYS"

writes KRW Hydraulic Press customer,  
George Perkins

MANUFACTURER OF  
PERKINS SAFETY SADDLE TANKS



K. R. Wilson,  
215 Main St.  
Buffalo 3, N. Y.

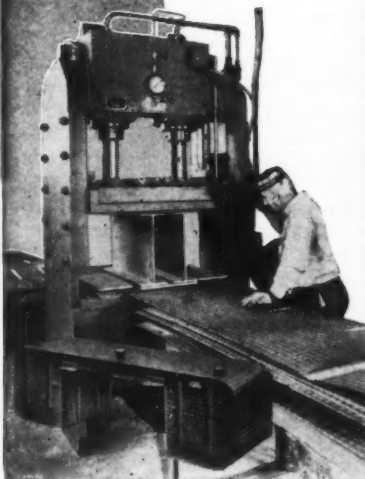
Gentlemen:

I'm not usually a testimonial writer, but I can't help letting you know what a terrific job my new KRW 100 ton, 2 cylinder hydraulic press has done in my shop. My cost records actually show that this press paid for itself in just 62 days. And, believe it or not, I sold almost 9,000 tanks in 1950 without a single return or complaint.

Sincerely yours,

*George Perkins*

Perkins Welding Co., Buffalo, N. Y.



Mr. Perkins makes steel saddle tanks for big trailer trucks. They hold 125 gallons of gas, obviating the need for frequent stops to fill up. KRW engineers showed Mr. Perkins how to save time and cut production costs by forming and bending these tanks with a KRW hydraulic press. They also showed him how to form stiffening ribs on the tanks instead of the welded angle stiffeners he was using. Results? The tanks are now 60% stronger.

KRW Hydraulic Presses can do the same for you on literally hundreds of manufacturing jobs. Available in 25-150 ton capacities, they're entirely above ground. Hand operated, air operated or motor driven. One, two and three cylinder models. First investment is low, operating costs still lower. If you need a specially-built press, our engineering department will "tailor-make" one to your needs.

Ask your machinery dealer to quote you, or write Dept. 13.

## K·R·WILSON

215 MAIN STREET • BUFFALO 3, N. Y.

JUNE, 1951

MTBB

# HOW'S BUSINESS? • HOW'S BUSINESS? • HOW'S BUSINESS?

## Steel production high

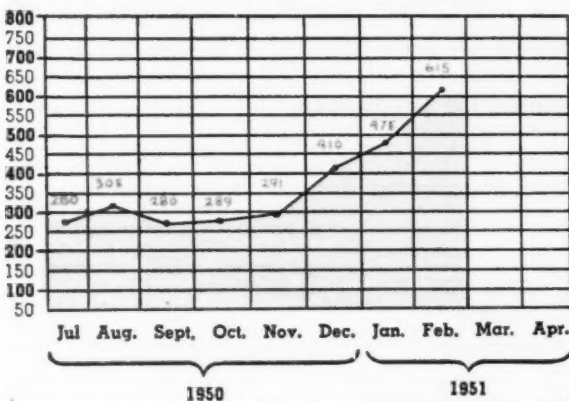
Steel production exceeded 9 million tons a month for the first time in history during March, 1951. Steelmaking furnaces poured

a total of 9,050,000 tons of ingots and steel for castings, an increase of 16.5% over February and 21% over March, 1951.

In twelve consecutive months the steel-making furnaces of the United States have poured nearly 100,145,000 tons of steel, an achievement never before equalled in a like period.

## Machine tool shipment chart

A quantity comparison chart between 1950 and 1951  
source: National Machine Tool Builders' Association



Month	Domestic	Foreign	Shipments
Oct.	289.6	49.5	100.9
Nov.	291.9	26.6	110.9
Dec.	410.1	112.8	135.7
Jan.	475.4	61.3	114.3
Feb.	615.8	80.1	122.2

The furnaces were operated at an average of 102.2% of capacity in March, an indication that steel companies are getting benefits from their large scale expansion and improvement programs.

The March output averaged 291,935 tons a day. The total output of March was nearly 207,000 tons higher than the production of January, 1951, previously the month of the highest total.

## Production down

Recent reports indicate that the production index is slightly down for the period just ending, reflecting the slow cessation of civilian output without the compensation of an immediate pickup in defense. In time the defense work will compensate for the slowing civilian production. Automobile production is down, reflecting

the restrictions on the end-use of steel, restrictions which went into effect with the second quarter.

While passenger automobiles show a decline, truck production is at the highest level it has been for years even though a drop in truck production is recorded. Truck output is not restricted by the lack of steel. Reports from some trailer manufacturers indicate that tires are becoming scarce and many trailers are standing idle in storage lots waiting for rubber. For a while customers supplied their own rubber for quick delivery of trailers, but trailer manufacturers say that even this source of rubber tires is drying up.

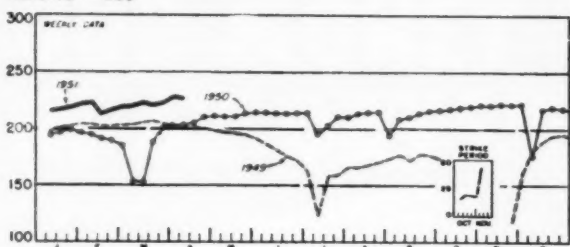
#### Steel scrap critical

With stocks of iron and steel scrap just about one-half of a safe working inventory or less, the steel industry and other consumers are facing a critical situation and collection of this vital raw material must be stepped up if current high operating rates are to continue.

Last year an all-time high of 29 million gross tons of purchased scrap were consumed in this country to produce approximately 96,700.00 tons of steel ingots and castings. With expansion taking place the steel industry at a rapid rate, which will continue throughout this year and next, there may be a potential scrap deficit of between 5 and 7 million tons between now and the end of 1952, when it is expected the capacity of the steel in-

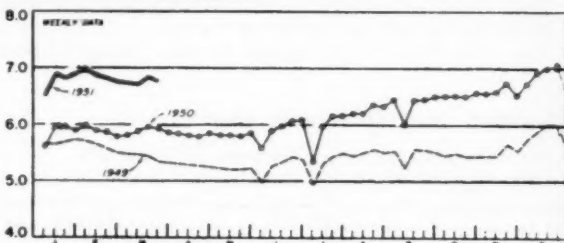
#### Steel ingot production

1935-39 = 100



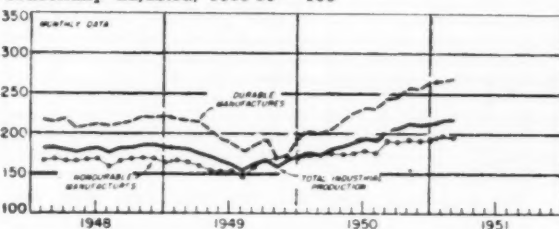
#### Electric-power production by utilities

billions of kilowatt-hours



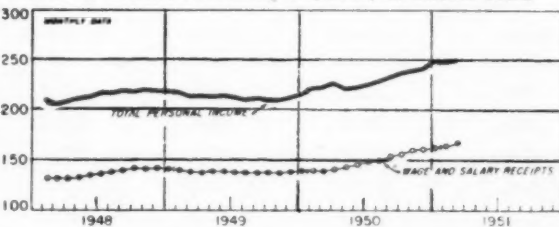
#### Industrial production

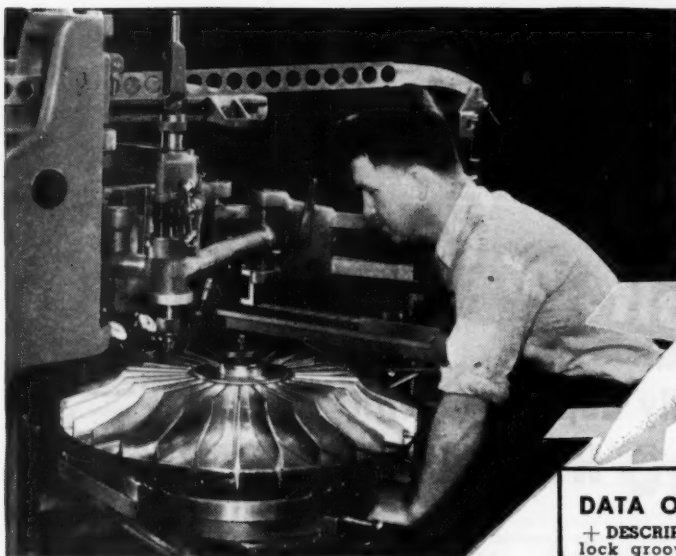
seasonally adjusted, 1935-39 = 100



#### Personal income

billions of dollars, seasonally adjusted, at annual rates





One application of the pantograph machine among hundreds throughout industry.

## Production Zooms 500% on Aircraft Engine Parts

With Gorton pantographs and die and mold duplicators, you increase production, lower costs and do more accurate profiling, routing, die sinking, mold cutting, counterboring, chamfering, grooving, graduating or engraving. These machines are indispensable on many jobs involving either commercial products or material for the armed forces.

You can machine ferrous, non-ferrous or plastic materials . . . in *work shape* that's flat, uniformly curved, cylindrical, spherical or irregular . . . in *work size* varying from dime-size parts to areas as large as 10 by 20 feet.

*Repetitive accuracy*, a dozen or a thousand pieces, is yours with *enlarged masters* that give you advantages of the reduction ratio — an *exclusive* pantograph characteristic. You can depend on fast cutting and high surface finish from high-speed steel or carbide cutters and burrs in a wide range of spindle speeds up to 45,000 R.P.M.

Mail coupon or write for copy of the Gorton General Catalog — no obligation.



### DATA ON THIS JOB

+ **DESCRIPTION:** Mill 58 key lock grooves 2.360"-2.460" long by .076"-.080" wide by .028"-.030" deep in edges of compressor impeller blades. Material is heat treated aluminum alloy forging; hardness — 120 Brinnell. Size, 28.800" dia., by 7 1/2" thick.

+ **HOLDING FIXTURE:** Special; arranged for manual indexing and incorporating opposed dial indicators for positioning each blade.

+ **MASTER:** 3-dimensional, semi-automatic; pneumatically operated; enlarged 5 times.

+ **CUTTER:** 2-flute ball nose solid carbide, running at 10,500 R.P.M. Feed, 5.9" per minute with coolant. Depth of cut, .030"; width, .080".

+ **MACHINE:** Standard Gorton 3-L 3-dimensional pantograph with special tooling.

**Results:** Floor-to-floor time, after set-up, is 50 minutes. Previous method took 5 hours.

Please send at once complete information about the Gorton line contained in Bulletin 1655-1406

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# U-Bolts or Centered Eyes

rapidly duplicated with

## diacro HYDRA-POWER BENDER

At last—a PRODUCTION BENDER that “Bends them ALL”—tubing—angle—channel—extrusions—moulding—strip stock—bus bars—and of course—all types of solid materials. U-Bolts and Eye Bolts are just two examples of the shapes that can be rapidly produced in one operation with this hydraulic power bender.

← An example of large radius forming



The DI-ACRO HYDRA-POWER BENDER can be easily set up in your own plant for a great variety of forming operations or it can be delivered completely tooled for speedy production of a specialized part. Investigate this universal machine before you buy any “single purpose” bender.

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“Die-Less Duplicating”  
Catalog**

giving full information on all DI-ACRO Benders, Brakes, Shears, Rod Parters, Notchers, Punches—also our offer of free DI-ACRO Engineering Service.

DI-ACRO is pronounced “DIE-ACK-RO”



**O'NEIL-IRWIN MFG. CO.**

314 8th Avenue, Lake City, Minnesota



dustry will reach 117,500,00 tons.

It has become increasingly difficult to procure scrap from Germany. While orders for upwards of 400,000 tons have been accepted, only about 200,000 tons were received from this source during the past year. A large potential source is the far east. It is estimated at least one-half million tons could be collected in the Pacific and brought back to this country. There are also a number of sunken ships on the Normandy beach which, if raised, would yield scrap.

#### New steels save critical alloys

A steel industry committee succeeded in developing new types of steel which will stretch the nation's supply of critical alloying elements. Boron plays an important part in this development.

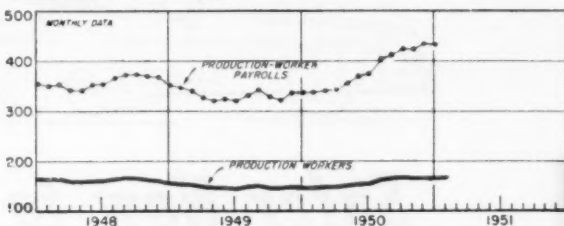
It was found that the amounts of alloying elements, nickel, chromium, and molybdenum could be reduced 50%, provided small quantities of boron were used carefully. Boron peps up the performance of lean alloys steels. It increases the hardenability of the steels.

Two series of steels have been developed for practically all the engineering and construction purposes for which standard alloys steels are used. The new steels, which are balanced multiple alloys steels, are designed to make maximum use of the alloys contained in scrap. Both series contain an average of .30% nickel and .12% molybdenum; plus boron. One series contains an average of .25% chromium, the other .43%.

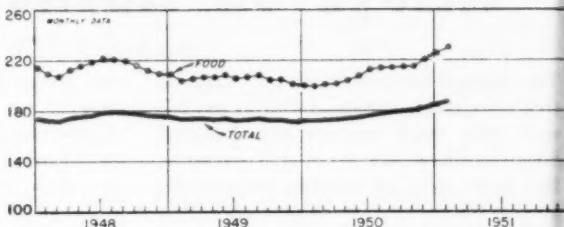
#### Inside Washington

India, bitter because there is delay in shipping our wheat, has prohibited export of all indigenous metals in any form. In the past it sent us 50% of all its manganese, over 25% of all the manganese we used . . . ECA has supplied funds to enable Greece to explore the classic island

#### Manufacturing employment and payrolls unadjusted, 1939 = 100



#### Consumers' prices 1935-39 = 100



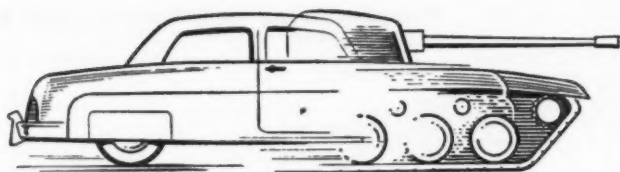
of Samos for manganese. Recently EAC sent milling machines, lathes, and a number of machine tools to Burma, Thailand, and Indo-China. To France ECA sent machine tools to modernize automobiles. Other machine tools, for various purposes, were sent to Western Germany.

#### "Pool orders" lost in jungle

The "pool orders" plan is temporarily snarled in the jungle of Washington red tape. Of the \$350 million worth of tools which the government planned to place with machine tool builders, only about \$100 million are being placed now.

Speaking before the Westinghouse Machine Tool Electrification Forum, Tell Berna, general manager of the National Machine Tool Builders' Association, said the "pool orders" would do machine tool builders little or no good.

The machine tool industry is not concerned with obtaining materials for orders coming off the line two years from now, he said, they are concerned with obtaining now the raw materials needed to complete the units which are on the assembly line.



## ***Safer Now to Buy*** **Alloys on Hardenability**

The defense program requires conservation of strategic metals—so, as in the last war, alloy steel analyses are changing. Some standard alloys are still available. But many new, or interim, analyses are already on the market. Others are on the way.

Today more than ever, under these changing conditions, the safest way to buy alloys is on the basis of analysis *and* hardenability rather than on analysis alone. When we know the hardness or tensile strength you need, we make absolutely sure that the alloy you receive meets your requirements—even though it will be many months before standard hardenability ranges of the new steels are established. Here is how we do it:

We carefully test each and every heat of as-rolled and annealed alloy steel in

our stocks. This gives us actual knowledge of the hardenability of every bar of Ryerson alloy. Thus when you specify on a hardenability basis you can be sure the alloy you get from Ryerson will meet your requirements. And you can also be sure of getting the desired heat treatment results because the test information and other helpful data to guide you come with the steel.

Not every company makes these tests, records this information, but Ryerson does—and at no extra cost to you. It's all part of a service system called the Ryerson Certified Steel Plan. So during this confusing period, order by AISI and SAE number if you wish but also specify hardenability and be doubly sure. Though some shortages are inevitable, we will do our level best to supply the alloy steel you need.

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**If you break only one tap  
a day . . you haven't licked  
your tapping problems**

**by Harry Conn**  
Chief Engineer  
Scully-Jones &  
Co., Chicago

YOU ARE SAYING to yourself, at least some of you are, what is so hard about tapping? "We've had that solved for years." Have you? Then you are one of a select few companies that have. We, at Scully-Jones are called upon for assistance by many of the country's largest companies, quite a few small ones, to help them on tapping problems. If you break one tap a day in your plant, you don't have the problem licked. You may be saying this about tapping, "at least we are on the right track." That may be very true, it might be well to remember that the horse that came in last was on the right track. If you sit still on the "right track" long enough you will get run over. As we all know there are several firms that derive handsome returns from the manufacturing of tap disintegrators and extractors. One of America's foremost tapping authorities has said, "Only ten per cent of the taps that are manufactured are worn out, the remaining 90% are broken in usage."

When confronted with tapping prob-

lems we usually find the cause to be an error in one of the fundamentals of tapping. Any manufacturing method has its fundamentals whether it is a grinding, turning, reaming, blanking or a forming method. There certainly isn't time here to go into all these manufacturing methods so we will discuss how we would go about solving a tapping problem.

**Size of hole  
is important when**

. . . you're having trouble in tapping, and also when tooling up a new job. Many product designers still specify 83 per cent thread for general usage and even sometimes 100 per cent, deriving their information from old handbooks that were written and compiled by people equally uninspired as themselves. For example: compare your old handbook tap drill charts with the timetested chart on page 800-801 in the

# 1. PERCENT OF THREAD CHART

Thread Diameter and Pitch	Tap Drill Size		Percent of Full Thread
4-40	42	.0935	57
48	41	.0960	59
5-40	37	.1040	65
44	36	.1065	63
6-32	34	.1110	67
40	32	.1160	68
8-32	29	.1360	69
36	28	.1405	65
10-24	23	.1540	67
32	20	.1610	71
12-24	15	.1800	67
28	3/16	.1875	61
1/4-20	5	.2055	68
28	7/32	.2187	67
5/16-18	17/64	.2656	65
24	J	.2770	66
3/8-16	P	.3230	64
24	R	.3390	67
7/16-14	V	.3770	65
20	X	.3970	62
1/2-13	7/16	.4375	63
20	29/64	.4531	72
9/16-12	1/2	.5000	58
18	33/64	.5156	65
5/8-11	35/64	.5469	66
18	37/64	.5781	65
3/4-10	21/32	.6562	72
16	45/64	.7031	58
7/8-9	25/32	.7812	65
14	13/16	.8125	67
1-8	57/64	.8906	67
12	59/64	.9219	72

new "Tool Engineers Handbook." A 1/2-13 tap that cuts a 60 per cent thread will only consume approximately 1/2 as much torque as a 1/2-13 tap that is cutting a 100 per cent thread.

The percentage of thread in a hole does not have any bearing whatsoever on the class of fit. Even though the minimum and maximum sizes of holes are listed in the "Screw-Thread Standards for Federal Services" manual. The minor diameter of the threaded hole of any given size and pitch is the same for fit of classes 1 to 4, inclusive, but is larger for class 5 fit. A 100 per cent thread is only 5 per cent stronger than a 75 per cent thread. A 50 per

cent thread that is deeper than 1 1/2 times its diameter is 80 per cent as strong as a full thread. The tap drill chart shown in figure 1 is a chart that is very different from the tap drill charts used by most engineering departments. The tap drill charts that are usually seen hanging in tool-rooms, machine shops, and engineering offices state that they are figured to obtain an approximate 75 per cent of thread.

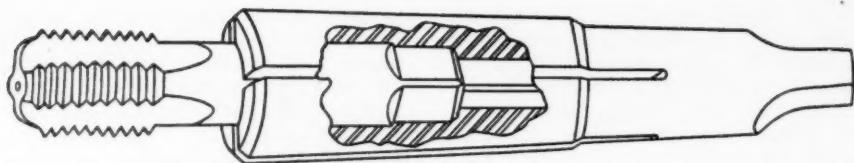
A close examination will reveal that they vary as much as 20 per cent. This tap drill chart is used in the Scully-Jones engineering department. Deviations are made from this chart only when an unusual amount of strength is needed in the tapped hole.

Many manufacturers have reduced the percentage of thread to 50 per cent in some materials and retained enough strength in the threaded hole to insure that the threads on the standard bolt will strip before the threads in the hole, providing their materials are similar. Why should parts made of stainless steel, monel, copper and some heat treated alloys have threads of 83 per cent? Especially when they will be used for fastening name plates, covers, panels, flanges and for general assembly where none of the bolts are stressed to even 1/4 their elastic limit? It stands to reason that the less torque a tap requires the easier it is on it and the longer it will remain sharp and efficient.

When the size of the hole is correct for the smaller taps they require but very little pressure to make them start cutting in some materials.

## Depth of hole too shallow

... is another common fault. Many people specify the depth of a hole not thinking of the method of tapping. In many transfer machines the hole is drilled immediately preceding the tapping station, and if the chips have not



**2. Style "A" tap chuck . . .** has a collet action which grips the tap on the shank and drives it by the square.

been removed from the hole, the tap will break after having packed them solidly. The majority of times the cycle time would have permitted them to have been drilled deeper. Special attention must be paid to the depth of the hole if you are tapping the hole in two operations. The first tap should cut at least 1 more thread than the finisher, and the finisher should have a shorter chamfer than the roughing tap. In machines, of up-to-date designs, of the transfer type, a turnover station is incorporated in the design of the machine so as to empty the chips from the bottom of the hole.

### **A tapered thread is a plague**

. . . that has made the rounds of most plants and misalignment is invariably the cause. There are many factors that can enter into misalignment and almost all of them demand investigation. Some of the factors are spindle runout, tap shank tolerance, index error, expansion and contraction of machine and fixtures due to heat and fixture design. The tap chuck shown in figure 2, is a tool that has a collet action which grips the tap on the shank and drives it by the square. The collet action compensates for the manufacturing tolerance on the tap shank and the broached square makes it a non-slip positive chuck.

Several special machinery manufacturers compensate for the index error, expansion and contraction of the machines and fixtures and jig borer limi-

tations, by incorporating some float into the design of their spindles. This hardly seems the correct method of correction because as the machine is used the float becomes more pronounced and too much float is worse than none at all. The most accepted practice is to use a floating holder as shown in figure 3. The design of this floating holder is more efficient because it has the floating element divorced from the driving members. Unless it is designed in this manner you can not achieve a real float, you only get a wobble or a floating action with dead spots or positions of bind instead of float.

When the turret on a turret lathe is worn to the point where it is lower than the spindle and out of line, some means must be taken to align the tap with the hole and a floating holder is the surest and most economical method.

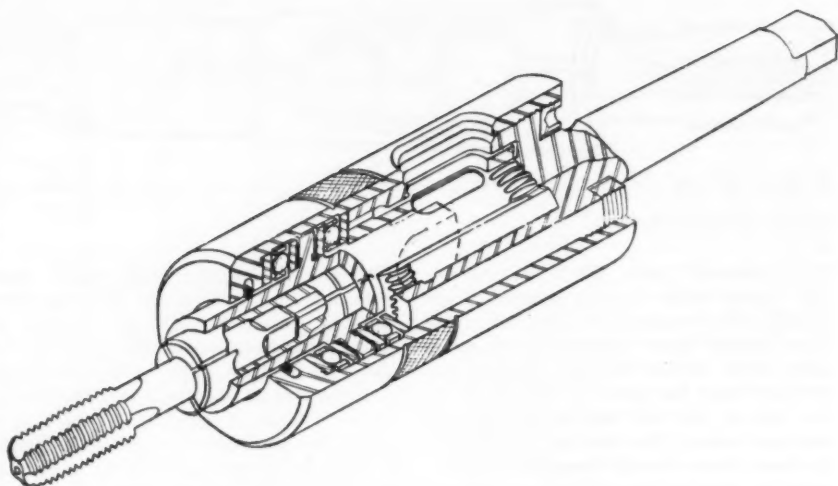
The floating action must be a parallel float and not an angular float.

There are very few that hold to the theory that you should not let a tap float but they are almost invariably speaking of taps of  $\frac{1}{4}$  size and smaller. Certainly, they are not being realistic or practical if holding to this theory when referring to large multi-spindle, multi-station machines.

### **Lead screw tapping is similar to top rake on a cutting tool**

It will not revolutionize tool engineering. It is not my purpose to mini-





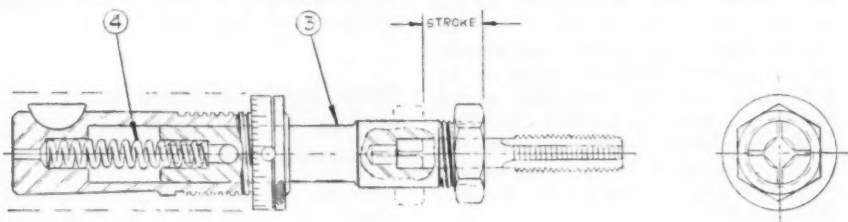
**3. Style "JA" floating holder . . .** an efficient holder because the floating element is divorced from the driving member.

mize or discredit lead screw tapping. I am aware, though, of the fact that one precision tapping machine manufacturer has over 9000 machines in the field and only 3 are equipped with lead screws. Those three were so designed because the application demanded a definite starting point for the thread. The same manufacturer sold seven machines that are not

equipped with lead screws for the purpose of tapping micrometers, and they have been working in a satisfactory manner for over 8 years. On the other hand there are tapping machine manufacturers who include lead screws with every machine.

One thing is certain, a lead screw will not correct a lead error that is on the long side on a tap. With more and

**4. Compression tap holder . . .** This holder has many advantages. For one thing, it enables the operator to adjust his tap to a depth of plus .001" or minus .001".



more manufacturers discarding cut thread taps that have an industry wide, lead tolerance of .003 per inch, for precision ground thread taps, the lead problem is being overcome. There are many instances where lead screws are certainly advisable. To be specific, when tapping tapered pipe threads; when the tap must make an interrupted cut; when large diameter fine pitch thread; if the thread must have a definite starting point; and many times to be certain that the tap is given sufficient pressure to make it start cutting. A lead screw is certainly advisable when tapping the higher classes of fits.

To make a lead screw to correspond exactly with the lead on the tap is really a tool engineering feat and, theoretically, it is impossible.

They do come very close, but to take up this slight difference and for many other reasons that I will explain, special machine designers incorporate in their designs standard compressions tap holders figure 4.

The compression tap holder has many advantages. Several of them are: it

enables the operators to adjust his tap to a depth of plus .001 or minus .001; the spring compensates for the difference of tap lead and the lead screw lead; the spring also enables the tap to telescope or recede into the spindle or holder shank in the event that there isn't any hole to tap, instead ruining or springing the tapping spindle and also breaking the tap. The tapping machine spindle in figure 4, is shown in phantom lines. The collet action of detail 2 compensates for the tap shank variations and the broached square affords a positive drive. The spring detail 3 also absorbs the shock that is caused when reversing the tap at the bottom of the hole.

### Investigate the coolant if

... you have not been able to eliminate your difficulties. Figure 5 shows a chart recommending the proper coolant, tapping speed and cutting face angle. Many firms use the same coolant for every tapping application regardless of material, etc. To use the same coolant for every cutting tool operation makes

## THIS QUIZ IS A STEAL

by Professor Herman Reichardt, Consulting Engineer

Count ten for each question answered correctly. 90-100 is excellent; 70-80 is good; below that . . . well, you're probably very good at woodworking.

1. Annealing **increases** or **reduces** stress. \_\_\_\_\_
2. Ageing is exposing metal to a **rapid** or **extremely slow** cooling temperature. \_\_\_\_\_
3. Tempering is reheating hardened steel to a temperature **above** or **below lower** critical temperature. \_\_\_\_\_
4. Bessemer Process is **blowing into** or **withholding** air from moulten pig iron. \_\_\_\_\_
5. Blisters are caused by **too rapid** cooling or **gas bubbles**. \_\_\_\_\_
6. Burning of metal is caused by **too high** temperatures or **temperatures near melting point**. \_\_\_\_\_
7. Centerless grinding **requires** or **does not require** end supports. \_\_\_\_\_
8. Crucible steel is melted in **open** or **closed** crucibles. \_\_\_\_\_
9. Cyanidizing **is** or **is not** generally followed by quenching. \_\_\_\_\_
10. Blooms and billets are **finished** or **semi-finished** steel. \_\_\_\_\_

Answers to quiz on page 299.

about as much sense as using ordinary lubricating oil for drawing compound in your press shop. There is a correct lubricant for every job and I don't think white lead is the correct lubricant for any tapping application.

Another fault that has been common in tapping operations is the surface speed of the tap. Many times the speed is too slow. Figure 5 shows the correct cutting speed for each class of fit in the most widely accepted materials.

### More care taken in making taps than in using them

The fault found with coolants is usually the same fault found with the tap itself: it seems manufacturers use the same style of a tap for every operation. There is also a right design of a tap for each material but it is up to the individual who orders or specifies the taps that he obtain the correct tap. A well known authority on tapping has said

## 5. SUGGESTED SPEEDS, LUBRICANTS, AND CUTTING FACE ANGLES FOR TAPPING VARIOUS MATERIALS

High speed steel taps				
Feet per minute				
Material	Precision	Production	Lubricant	Cutting face angle
	tapping	tapping		
	Class 3 & 4	Class 1 & 2		
Allegheny Metal .....	10-15	15-30	Sulphur base oil	10-15 Hk.
Aluminum .....	45-50	90-100	Kerosene and lard oil	10-15 Hk.
Bakelite .....	30-35	60-70	Dry	4-6 Hk.
Brass .....	45-50	90-100	Comp. or lt. base oil	Rad. -5 Hk.
Bronze .....	20-30	40-70	Comp. or lt. base oil	6-10 Rk.
Bronze-manganese .....	20-35	30-50	Light base oil	8-10 Rk.
Copper .....	45-50	90-100	Light base oil	15-20 Hk.
Die castings				
Aluminum .....	30-40	60-80	Kerosene and lard oil	10-15 Hk.
Zinc .....	30-40	60-80	Compound	10-15 Hk.
Duralumin .....	45-50	90-100	Comp. or Kero. and lard oil	10-15 Hk.
Fiber .....	40-50	80-90	Dry	4-6 Hk.
Iron				
Cast .....	35-40	70-80	Dry or compound	Rad. -5 Rk.
Malleable .....	20-30	50-60	Comp. or sulph. base oil	Rad. -5 Rk.
Monel metal .....	10-15	20-30	Sulph. base or Kero. and lard oil	10-15 Hk.
Nickel silver .....	35-40	70-80	Sulph. base or Kero. and lard oil	15-20 Hk.
Rubber — hard .....	40-50	80-100	Dry	10-15 Hk.
Steel				
Cast .....	10-15	20-30	Sulphur base oil	10-15 Rk.
Chromium .....	10-15	20-30	Sulphur base oil	10-15 Hk.
Machinery .....	20-30	40-60	Comp. or sulph. base oil or kerosene and paraffin	8-12 Rk.
Manganese .....	5-10	10-20	Comp. or sulph. base oil or kerosene and paraffin	10-15 Rk.
Molybdenum .....	10-15	20-30	Sulphur base oil	10-15 Rk.
Nickel .....	15-20	25-35	Sulphur base oil	10-15 Rk.
1020 Screw stock .....	30-40	60-80	Sulphur base oil	8-12 Rk.
Stainless .....	10-15	20-25	Sulphur base oil	10-15 Hk.
Tool .....	15-20	25-30	Sulph. base or kero. and lard oil	8-12 Rk.
Tungsten .....	10-15	20-30	Sulphur base oil	10-15 Hk.
Vanadium .....	10-15	20-30	Sulphur base oil	10-15 Rk.

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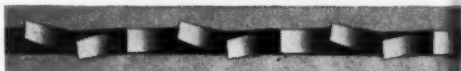
**"RED END"**

## Hack Saw Blades

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### PRECISION SET TEETH



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### UNIFORM HARDNESS

Simonds Method of Heat Treating produces uniform hardness throughout the length of the blade unapproached by conventional heat treating methods. As a result, there is no variation in the grain structure of the steel and the teeth hold a cutting edge longer. This means consistently better cutting performance and low cutting costs.

### A "RIGHT" BLADE FOR EVERY NEED

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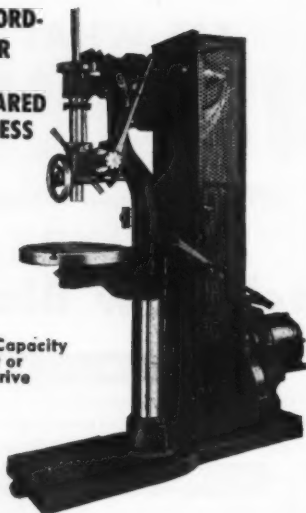
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HACK SAW  
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**BOX B**

**ROYERSFORD, PA.**

**6. TAP TORQUE CHART (For sharp spiral  
point taps in screw stock)**

Nominal Tap Size	Approximate Inch Pounds Tapping Torque Based on:		
	60% Thread	75% Thread	85% Thread
1/4-20	20	25	30
1/4-28	10	15	20
1/2-13	80	110	135
1/2-20	40	50	65
3/4-10	195	280	345
3/4-16	85	115	185
1-8	415	585	720
1-14	140	200	250

that 70% of the taps that are used are not the correct tap for the job on which they are used. Many firms have increased the strength of their small taps, by reducing the number of flutes, thereby increasing their cross-sectional area. In some instances trouble has been eliminated by changing the rake angle of the tap. Figure 5 also shows the correct rake angles for various materials.

A ½-13 tap is supposed to be able to withstand 1000 in.-lbs. of torque before breaking. According to the chart in figure 6, a ½ tap, tapping in screw stock, an 85% thread should only consume 135 in lbs. of torque. Therefore, there must be one of the aforementioned tapping fundamentals radically wrong before a tap breaks, unless the tap is just plain dull. **The End.**

Gerry T. Attridge has been appointed to the position of assistant general manager of Lovejoy Tool Co., Springfield, Vt. Formerly, Mr. Attridge was chief development engineer. He has been with the Lovejoy company since 1946, and is responsible for the design and development of the Lovejoy Type "S" Milling Cutter.

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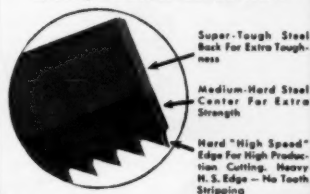


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UNITED STATES STEEL

## **Reduce wheel and grinding costs with atomized spray grinding coolant**

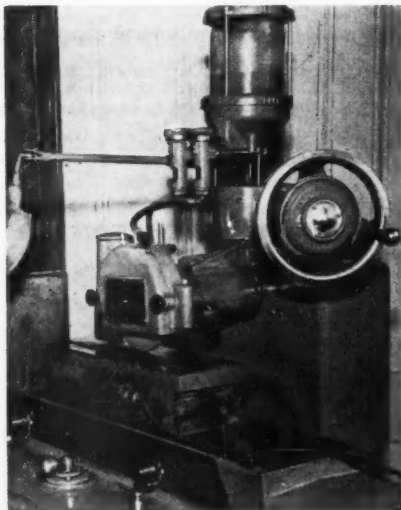
by **H. J. Chamberland**  
Research Engineer  
The DoAll Company  
Des Plaines, Ill.

GROUND SURFACES of micro inch accuracy without disregarding the time element, are the result of a combination of factors such as: 1. rigidity to less than .0001" between wheel and work; 2. constant film of oil between the ways to prevent settling, plus a constant film of oil as a cleaning agent; 3. hydraulic drive or "liquid" power

for smoothness of operation; 4. separation of automatic and manual cross-feeds for maximum accuracy life; 5. finger-tip controls for simplified operation; 6. last but not least, a dependable coolant system but preferably one providing foolproof results, such as the atomized spray. Although a single one of above first five constructive features, if inefficient, could well disrupt all others, the fact remains that collectively and at their best they can yet prove of little value if the coolant functions improperly.

This article particularly concerns the surface grinding of properly hardened precision tool work, maintaining the desired degree of flatness, parallelism, surface finish and dimensional accuracy if and when all four are essential. This can be accomplished only by giving the coolant the utmost consideration and to-day, in relation to type of equipment herein concerned, there are two methods by which it can be applied.

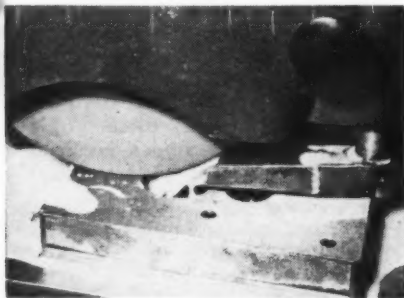
**Cool grinding . . .** results in increased depth of cut, while reducing wheel costs by substantially extending time between dressings. (Photo: Krause Testing Machine Co., Columbus, O.)



## **Conventional, or recirculating method not fully effective**

... and for this particular reason: it will be noted that the blast of air from the fast revolving wheel blows away the coolant and leaves the surface of the work bare at the very location where it should be most substantial, figure 1. Therefore, it is obvious that if the coolant is to be dependable in this case, depth of cut and amount of crossfeed must be kept at a minimum; otherwise and depending on increase in depth of cut and crossfeed, the outcome could be surface cracks and even a change in steel structure to a depth of 1/32" due to a quick quench by the coolant flowing back over the abnormally heated surface. In short, every extra cut taken means that much increase in production cost while the opportunity still remains open for some operator to take the risk of maybe saving some time but likely spoiling an expensive tooling item on the verge of completion.

**1. Conventional coolant systems . . .** have this disadvantage: there's always danger of leaving the work surface bare at the critical wheel-work contact point. This is caused by the wind created by the wheel.

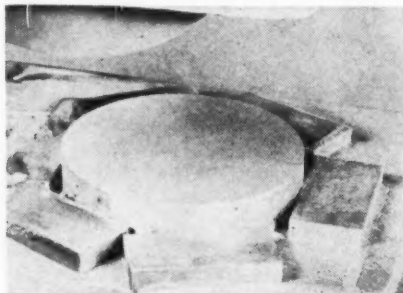


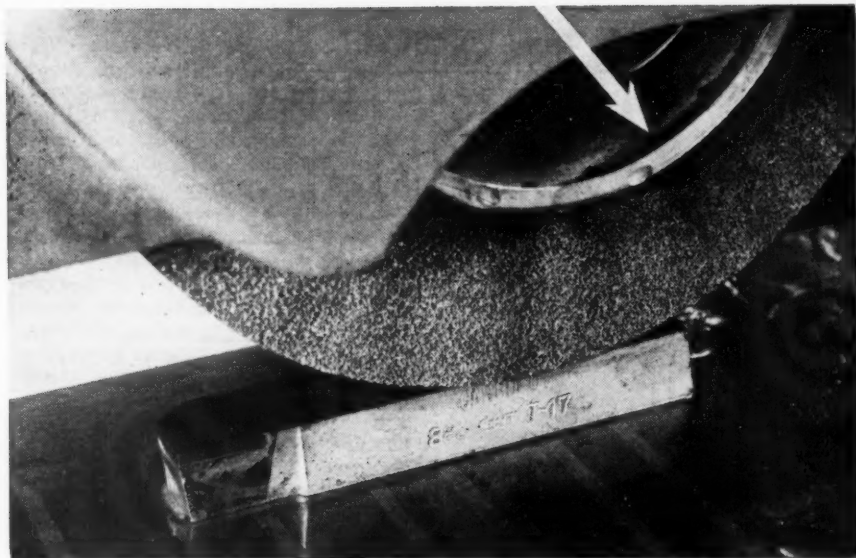
## **New Coolant technique is radically different**

... and the low cost of the attachment as based on its advantages, should by all means be appreciated when contemplating expansion or replacement along these lines, figures 2, 3, and 4. Primarily, wet grinding in this instance is "dry" grinding because there are no messy tanks, table guards and other inconveniences connected with conventional wet grinding procedure. As readily seen in figure 4 the system or attachment basically consists of three parts: 1. A reservoir mounted on top of the spindle housing which holds one gallon of a special coolant and enough for eight hours of continuous operation; 2. two sight drip flow regulating valves; 3. special wheel adapter. The system functions as follows:

The flow of coolant, a few drops per second, is controlled by the needle valves designed for very fine adjustment. The coolant flows by gravity

**2. Lapped-like surface ground finish . . .** of 3.7 micro inches r.m.s. Ground finishes of .000015" are common today on a production basis. Some have been held to .000007" using atomized form of coolant.



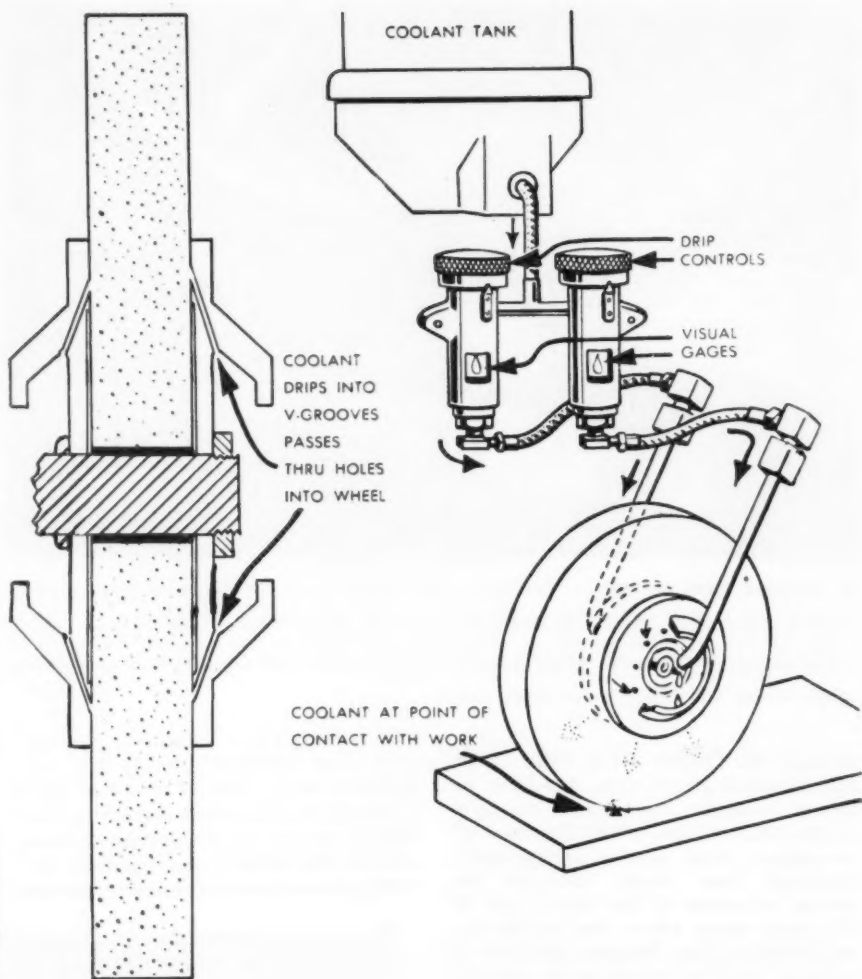


**3. Atomized spray coolant . . .** permits a .020" depth of cut and .015" crossfeed on this carbide tipped tool. Arrow indicates holes in the front collector ring through which the coolant is centrifugally forced into the pores of the grinding wheel and to its outer edges where the cutting action takes place.

through the flexible tubes fitted to the special wheel guard, then into both V-groove collector rings which are held on the sides of the wheel. The coolant, as mixed with air, is centrifugally atomized then forced through the porous channels of the wheel and to the outer edges where the cutting actually takes place. Because the flow of coolant and its wheel-work contact point are constantly under control, plus the fact that there is no recirculation to carry back foreign matter so detrimental to surface finish, it is not surprising why this new development results in considerably reduced grinding costs from increased depth of cut and crossfeed while reducing wheel costs by substantially extending time between dressings. The latter advantage

is doubly significant to-day and particularly so in relation to wheel forms produced by the crush technique; first, more forms can be ground per dressing; second, the work surface remains fully visible throughout the grinding process.

The atomized form of coolant, industrially known as "Cool Grinding," is showing remarkable results in all production departments and especially tool rooms where it has been put into effect. The most crucial test than can be given this unique method of coolant application is obviously on the tougher steel alloys and especially tools tipped with carbides. Let's consider a few typical examples of cool grinding on some of these materials.



4 .Schematic drawing . . . of atomized spray or Cool grinding attachment which uses an average of only 100 drops of coolant per minute.

**Case A: A piece of Ketos steel 1"x4"x8"**

The first cut was taken to a depth of .020" with a .020" crossfeed on the entire

surface, after completing the cut the piece was surprisingly cool whereas otherwise with this depth of cut most anything could have happened to the steel structure. A second cut was then taken by lowering the wheel another

.020" and using a similar amount of crossfeed, when halfway across the surface the crossfeed was reversed but there was no "spark out" which indicated that the wheel-spindle assembly was not sprung the least. This second cut was then completed. A final cut was taken by lowering the wheel only .0001" after marking the surface with a pencil but no marks were visible after completing the cut. Such performance surely demonstrates teamwork between ingenious grinder design and the atomized spray coolant, when supported by ample scientifically distributed weight and constructive features previously outlined.

#### Case B: Piece of 4" oil hardened steel to be plunge ground

... to close tolerance, both coolant application methods and dry grinding were tried as a comparative test. The conventional coolant was used first but because of the height of cut and the heavy flow required, the surface could not be observed closely, the coolant splashed all over and so this method was found to be impractical. Dry grinding was next resorted to but although roughing cuts were limited to .001" and finishing cuts to .0005", the wheel had to be formed ten times to obtain the specified tolerance of .0005. However, the centrifugal spray method permitted roughing cuts of .005" with no wheel reforming and thereby effecting an actual production increase of 40%.

#### Case C: Grinder equipped with recirculating and atomized spray systems.

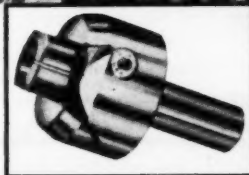
The part is a tool tipped with carbide, figure 3. The tool shank and tip were both ground at the same time, using a 7" x 1/2" silicon carbide wheel of 60

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grain and J grade with both tests. Cool grinding was used first and after taking six separate cuts at various depths such as indicated in table below, scientific checkings showed no evidence of either burns or minute cracks even with the maximum depth of cut of .020". However, an identical test repeated with the conventional coolant readily disclosed burns and cracks long before the .005" depth of cut was reached and where it had to end as readily seen. It will also be noted that

the amount of material removed per pass of the grinding wheel with the atomized spray is almost three times that possible conventionally, this is most significant when quality of work can meanwhile not only be maintained but definitely improved,

New super-tough high speeds are regularly being developed and each one is sure to present its own surface grinding problem, the proper coolant technique is sure to help materially as the use of these materials increases

Wheel Lowered	Material Removed Cool Grinding	Material Removed Conventional Grinding
	(Inches)	(Inches)
0.001	0.0010	0.0004
0.002	0.0020	0.0007
0.003	0.0030	0.0010
0.005	0.0050	0.0020
0.010	0.0085	None
0.020	0.014	None

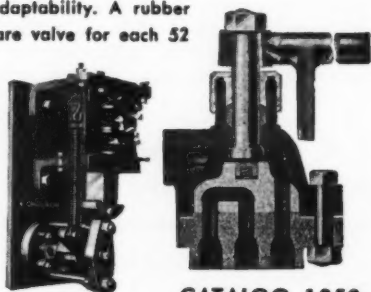
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to speed armament production. One type of high speed steel now on the market has a 30% tungsten content and is said to be the toughest material known, is even tougher than carbides. Alloys of this kind will surely bear watching because there are indications already that they are fast replacing carbides for some dies and tools. Thus far, no trouble has been experienced with the surface grinding of any of the high speed or other tool steels recently developed, in any instance where cool grinding facilities were available.

The End.



"No, no, Wetmore! I meant for you to grab one of the little shovels."



\* **WHO**

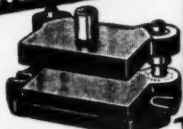
looks more like a busy, little beaver than a wise, old owl these days. But WHO\* is still—

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SIZES



## **Use of compressed air**

### **... speeds production**

### **of die cast parts**

THE SUCCESS or failure of a die casting operation is frequently dependent upon the ability of engineers and employees to set up high production processes. The use of compressed air, providing means for clamping, ejecting, feeding, cleaning, etc., is one method of speeding production on long runs.

The first part under discussion, figure 1, is an automobile generator end-plate, cast and finished by Die Casting Div. of the Cleveland Hardware and Forging Co., Cleveland, O. It is an example of a part which undergoes a minimum of change in design from year to year and consequently lends itself to mass production methods.

The end plate is cast of aluminum with one "shot" producing a "gate" of six pieces. The gates are broken off the casting which is then inspected for blowholes, cracks, broken cores, "cold shots" and other defects. The perfect parts are dropped in a bin arranged for the convenience of the trimming operation. Figure 2, shows the trimming die which shears the "flash" from the outside diameter and seven cored holes. The holes trimmed in this operation are

the two bolt holes "A" (see figure 1), two brush locating holes "B", brush mounting holes "C" and "D" and oil reservoir hole "E". Hole "C" is an elongated slot which carries an insulated sleeve for the brush leads.

The casting die is usually designed to hold the thickness of the flash to a minimum, especially at the trimming line. This means that the trimming die can be more of a "breaking" than a shearing operation. Frequently one-half of the die will have considerable clearance and may even be relieved in spots to serve a purpose. In the case of this casting, it is apparent from figure 2 that the lower die was cut away at intervals on the outer edge. This notching permits easier ejection. Notice the clever arrangement of the three air jets in front of the die. The blast from these jets penetrates the cutouts in the die, lifts the casting and blows it through the frame to a bin in the back of the press. A cam on the crankshaft

---

This article was prepared for the MACHINE and TOOL BLUE BOOK with the help of information furnished by the Compressed Air and Gas Institute.

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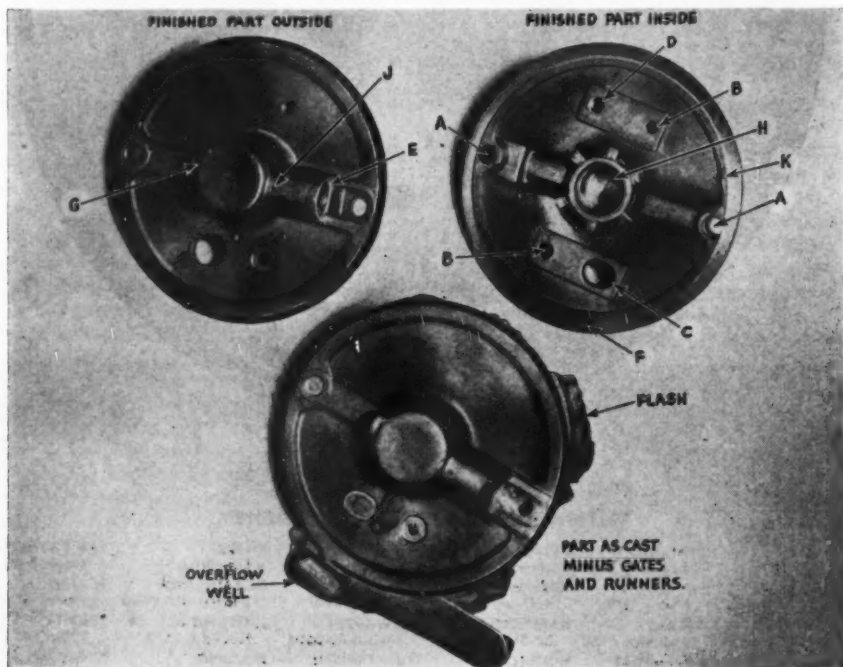
operates the air valve directly. The hole in the die-set below the center jet is used as an air inlet for internal lifting jets on other dies. These internal jets have the disadvantage of becoming plugged up with chips.

The trimmed castings are loaded on the bench where the face at hole "E" is filed to remove the ridge left after the trimming operation. Then the dowel hole "F" is drilled. A paint brush clamped in contact with the drill for feeding lubricant and removing chips is a common sight in these small drill presses.

A sloping bin brings the castings to the next operation which is performed

on a machine designed for this job by the company engineers. Hole "G" is drilled and hole "E" is sized and step reamed for a press fitting by two drill heads mounted in line. The fixture is loaded with one hand, while the other hand trips the starting lever enroute to the bin for the next casting. An air feed mechanism actuates a rack and pinion to feed the near drill spindle and a pinion on the feed shaft operates a double rack which delivers force from the top of the near pinion to the bottom of the pinion on the feed shaft of the far drill head. At the end of the feed, a trip returns the spindles to the starting position automatically, and the

**1. Automobile generator end-plate . . .** produced by die casting. This is an example of a part which undergoes a minimum of change from year to year. It lends itself to mass production techniques.





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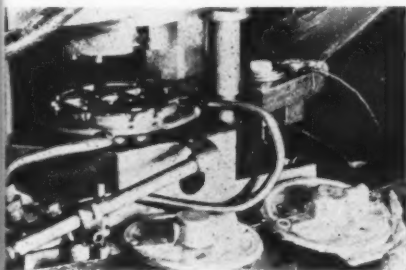
**85%**

OF ALL METAL CUTTING JOBS



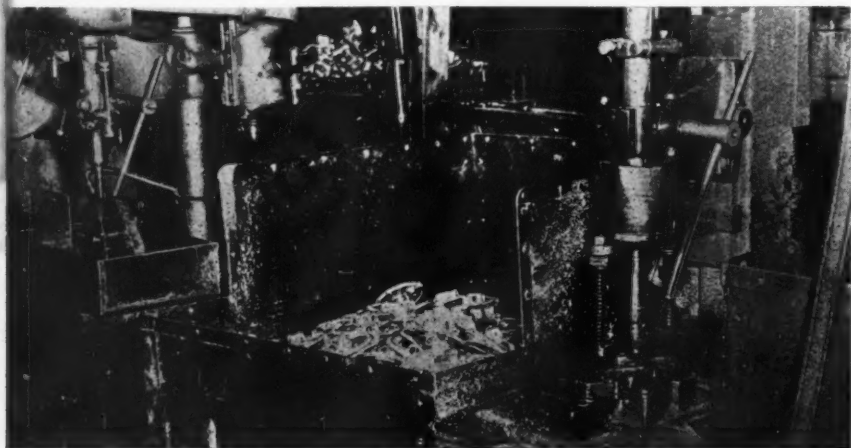
casting is dropped into the bin behind the operator. Coolant is pumped from a five gallon can built into the lower part of the frame.

Figure 3 shows the set-up at the left for reaming and chamfering hole "G". Note the work bin arrangement which allows time and motion economy in the handling of the parts. The machine at the right cuts an oil groove in bearing bore "H", (figure 1) in line with holes



**2. Three air jets . . .** arranged in front of the work. The blast from these jets penetrates the cutout in the die, lifts the casting and blows it through the frame to a bin in the back of the press.

**3. Reaming and chamfering hole "G" . . .** Machine at right cuts an oil groove in bearing bore "H" (figure 1) in line with holes "E" and "G".



"E" and "G". The spring loaded clamping bar trips a pivoted cutter in the boring bar as it is fed downward. An air gun, not visible in the picture, is provided at each machine for quickly clearing the fixture of chips.

The bearing bore is reamed to size and faced in the next operation, figure 4. The fixture is a clever adaptation of a rising clamp, universal drill jig. Above the clamping lever is the handle which starts the automatic cycle. Feed is controlled by an air-operated mechanism which can be seen in the picture running back horizontally from the feed shaft which would ordinarily be operated by a hand lever. A view is given also of the pressure regulator and filter used in the air supply line.

The next operation requires mounting the part by the bearing bore "H". The accuracy desired in the cut makes it necessary to be sure that the bore is

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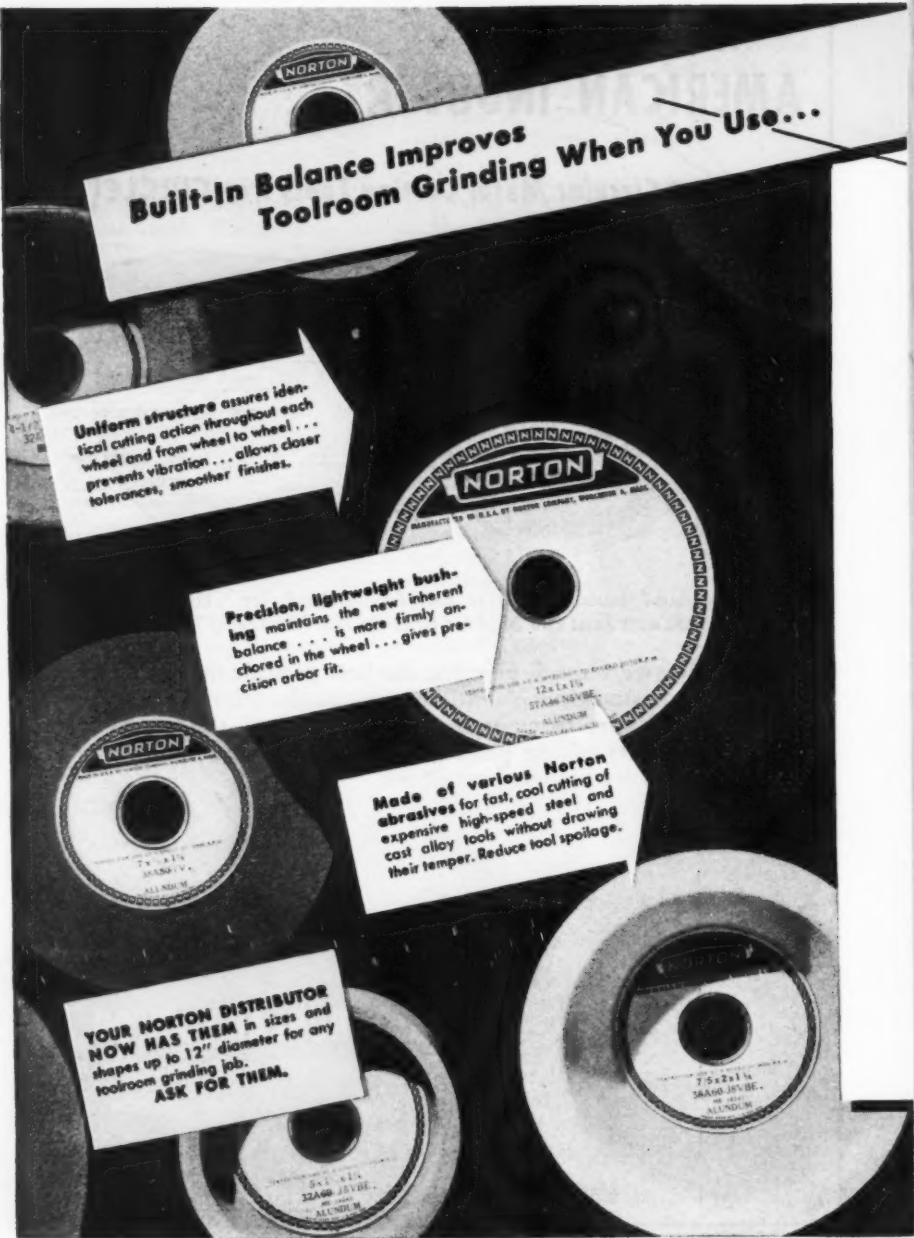


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NOW HAS THEM** in sizes and shapes up to 12" diameter for any toolroom grinding job.  
**ASK FOR THEM.**

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*Truly uniform within each wheel  
and from wheel to wheel*

## NO OTHER WHEELS GIVE YOU ALL 3

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**2. YOU GET MORE UNIFORM GRINDING ACTION** because the more uniform structure of Norton New-Process Wheels causes more even wheel wear. You also have perfect confidence that all identically marked wheels will perform identically.

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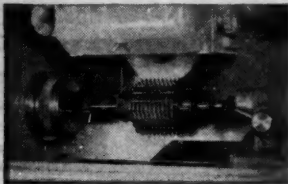
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## ABRASIVES

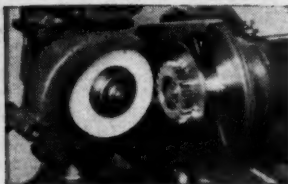
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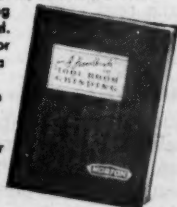
**CORNERS ARE HELD**, yet free cutting action maintained, when you sharpen gear cutting and splining hobs with Norton New-Process Alundum® Wheels.



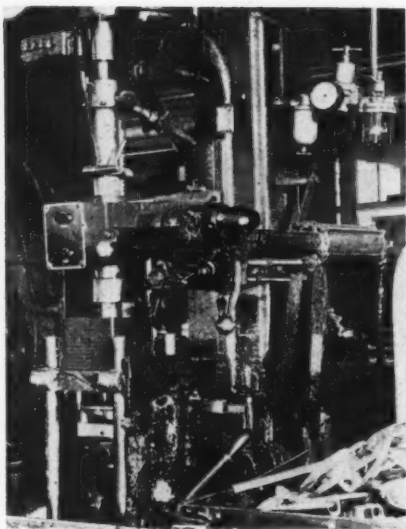
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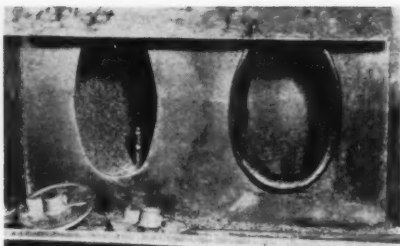
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**4. A clever adaptation . . .** of a rising clamp, universal drill jig. Here the bearing bore is reamed to size and faced in the next.

free of chips, so a small two station air blast chamber, figure 5, was designed to provide this cleaning with a minimum of lost time and discomfort to the operator. The two air jets visible in the picture are operated by one foot pedal. An air vent draws off the evaporated coolant oils while the chips fall to the bottom of the box. The left hand opening would ordinarily be padded also, but it was not in operation. The "porch roof" effect is to prevent a possibility of chips blowing into the operator's face.

The generator end plate is next mounted on the expanding collet of a bench lathe, for turning and facing the mounting hub "K". Since the collet is operated by an air chuck, it is easy to add two air jets. One jet blasts the



**5. A two-station air blast chamber . . .** was designed to blow away chips from bearing bore "H" by which the part is mounted for the next operation. Air jets are operated by a foot pedal.

chips toward the head stock where they circulate to the back of the lathe; another insures a freedom from chips at the spot where the indicator anvil contacts the cross-slide.

Figure 6 shows the set-up for drilling hole "J" and tapping the hole "D" which provides a ground connection for one brush in the generator. Here, again, the sequence of operations is speeded by the convenience of location of the bins and air guns as well as the gravity roller conveyor which carries the boxes of finished parts to the inspection and packing bench. The average production is about 4200 pieces in eight hours.

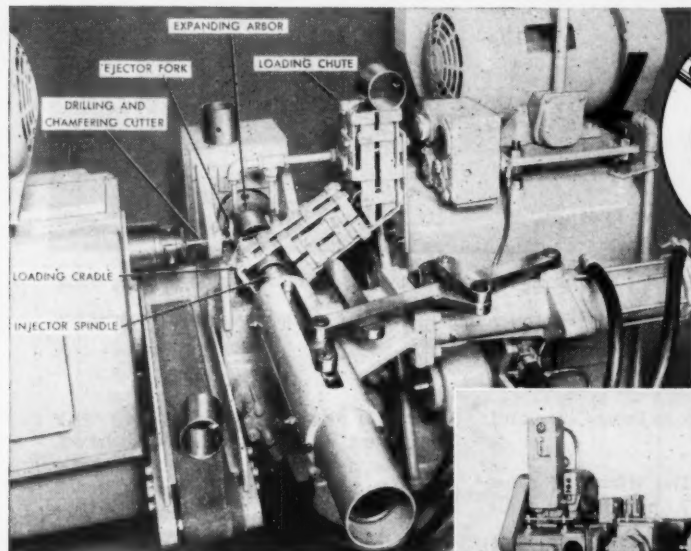
It is interesting to note the clever use of space, standard parts and materials, and available shop services in this production line. Compressed air is a prime essential to the operations.

### **Use of air can speed production on many operations as**

the following illustrations show. They are provided through the courtesy of Die Casting Div. of the Cleveland Hardware and Forging Co. and the

# MACHINE OF THE MONTH

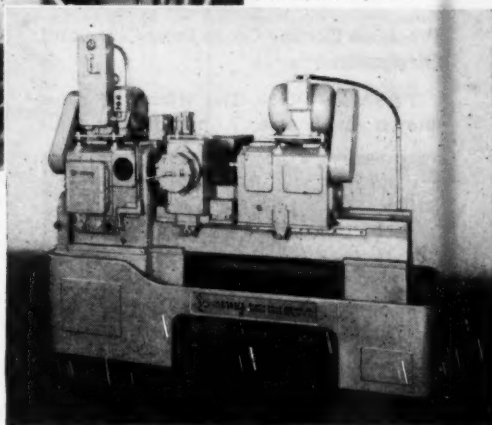
PREPARED BY THE SENECA FALLS MACHINE CO. "THE Lo-swing PEOPLE" SENECA FALLS, NEW YORK



▲ Schematic diagram showing application of two combination Drilling and Chamfering Cutters to work.

◀ Closeup rear view of machine with safety cover removed to show automatic loading mechanism.

▼ Overall front view of machine.



## MODEL "CS" AUTOMATIC DRILLING MACHINE DRILLS SMALL MOTOR FRAMES AT FAST PACE

**Problem:** To automatically load, drill and chamfer two holes at 180° and automatically eject small motor frames.

**Solution:** The Model "CS" Automatic Drilling Machine selected for this job was equipped with two Drilling Heads and a combination holding, loading and ejection mechanism shown in upper illustration.

In operation, the frames, which have been faced to length in a previous operation, are placed in the loading chute and fed by gravity to the loading cradle where they are picked up by the injector spindle and placed on an air-operated expanding arbor. The injector then retracts to clear the work and the two combination drilling and chamfering cutters advance in rapid traverse to the work piece; then slow down for the length of cutting stroke and finally return in rapid traverse to the starting position. The finished piece is automatically ejected by the ejector

fork and falls on a moving conveyor which carries it to a tote box, and at the same time keeps the machine clear of chips.

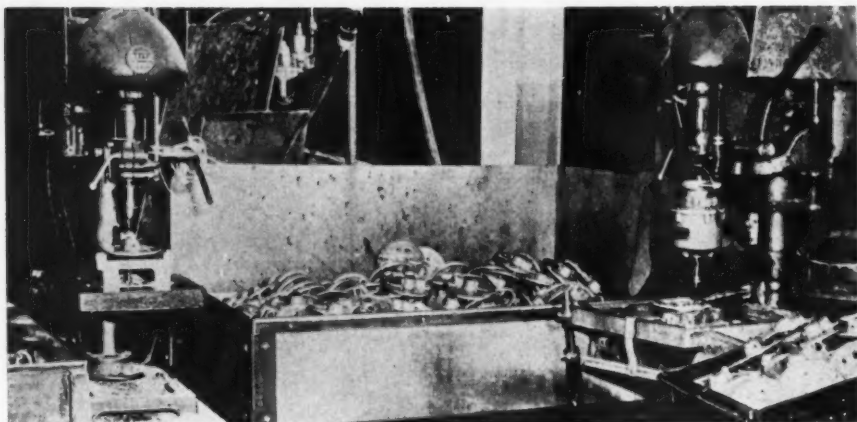
The entire operation is automatic and controlled by cams mounted on a camshaft which synchronizes all machine and loader movements. The loading and unloading takes place during a short dwell milled in the drilling head cams. The operator simply loads the parts in the loading chute, the machine takes over from this point. Production is 600 pieces per hour at 100% efficiency.

Consult Lo-swing engineers about your machining problems.

SENECA FALLS MACHINE CO., SENECA FALLS, N. Y.

PRODUCTION COSTS ARE LOWER WITH Lo-swing

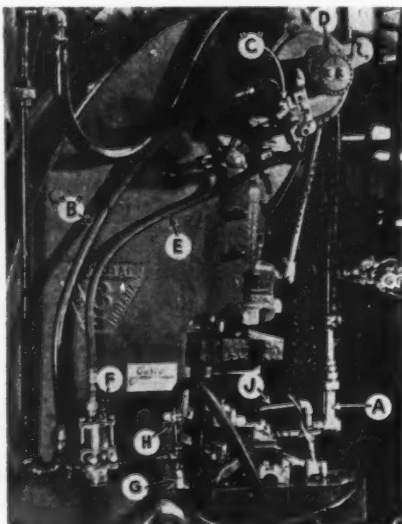




**6. Drilling and tapping . . .** Operation is speeded by the location of bins and air guns, as well as the gravity roller conveyor which carries boxes of finished parts to inspection and packing bench.

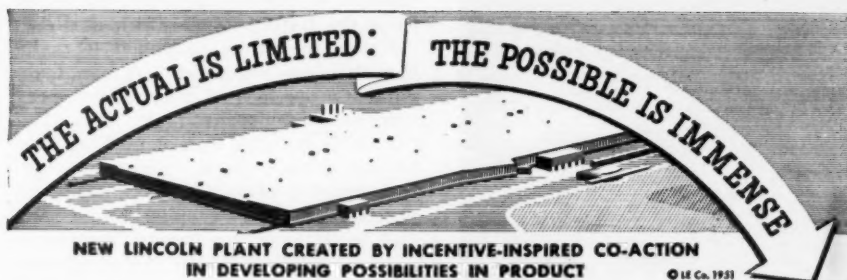
Precision Casting Co. in their Cleveland, O. plants.

**TRIMMING:**—The trimming press shown in figure 7 handles a wide



variety of jobs, but part of its accessory equipment is the air system shown. "A" is a chip blower with a right angle head. It is hanging within easy reach of the operator at the end of a rubber hose. As figure 7 shows, the hose is simply draped over the frame and wired, or clamped, into a convenient location. Hose B carries air to valve "C" which is tripped every cycle by cam "D". The air passes into hose "E" and actuates blast timer "F". This timer is adjustable and will provide a timed-supply of air. The line leaving the timer separates into two rubber hoses. Hose "G" carries the air to a hole in the die-set and then into air-jet ejector holes

**7. A trimming press . . .** handles a wide variety of jobs. Part of its accessory equipment is the air system which blows finished parts out of the machine. Control is by a timed supply of air.



## DESIGNS ORIGINATED IN WELDED STEEL ARE ALWAYS LOWER IN COST

WITH welded construction, new product shapes can be created, utilizing the inherent low cost economies of steel. There is less cost per pound with steel. Fewer pounds are needed. Furthermore, each pound of metal can be applied where it will do the most good.

Convention-bound designs can be completely discarded. Welding enables the engineer to exercise his imagination . . . to create more efficient product shapes

. . . to get better distribution of metal. He can use either standard rolled steel shapes or fabricate his own sections. The "thought starter" sketches show how a typical section may be developed to save material and cut labor cost. Your Lincoln Welding Engineer will gladly demonstrate how these basic cost-saving principles of welded steel can be applied to your products. Simply write The Lincoln Electric Company, Cleveland 1, Ohio.



Fig. 3. "T" section. Higher strength to weight ratio under lower loading conditions. Welded section distributes metal in outer areas. Needs 35% less metal than Figure 1. . . 40% less metal than Figure 2.

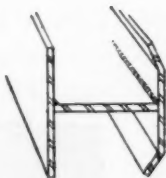


Fig. 4. Bottom flange of "T" section can be bent formed from light material. Welded section distributes metal on one side only to web. Saves 10% metal and 50% fabricating cost over section shown in Figure 3.

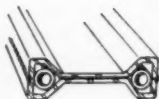


Fig. 5. Pressed steel section formed from light gauge metal. Use formed section for welded section. Welding and Automatic Lincoln welded at outer edges. Weights 80% less than Figure 1.



Fig. 6. Box section is fabricated from lighter gauge sheet than Figure 5. Welded section distributes metal in outer areas. Needs 50% less metal than Figure 1. . . 40% less metal than Figure 2.

## the ACTUAL

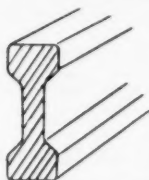


Fig. 1. Cross section through an iron cast-iron beam designed to resist a bending moment.

## increasing the YIELD

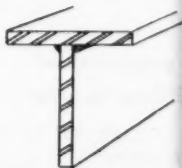


Fig. 2. Two section through comparative beams fabricated by welded steel. Needs 75% less metal than Figure 1 to achieve equal strength in bending.

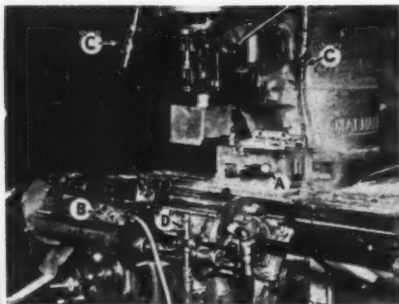
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**8. Production milling set-up . . .** for milling distributor mounting bracket for a tractor. Air is supplied to remove chips, operate pneumatic table, clamp the work.

in the die. Hose "H" leads to nozzle "J" which blasts the air lifted part out of the die-set into a bin in the back of the press. Where a very short blast will suffice, the timer can be by-passed. A variety of cams are available for opening the trip valve.

### **A production milling set-up**

. . . is shown in figure 8. Basically, it is a universal vertical milling machine with a special horizontal spindle and an extra-long, pneumatic, feed table added. Several milling jobs are performed with this machine. The only changes required are in the fixture and cutters. The part being milled in this set-up is a distributor mounting bracket for a tractor. Both faces are milled in one pass. The fixture is unloaded and loaded at each end of the table travel. Handle "A" trips a cam to actuate the air clamps. Switch "B" mounted on the air feed mechanism energizes a solenoid which operates a pilot valve controlling the direction of table feed. Since the cutters operate continuously, they are

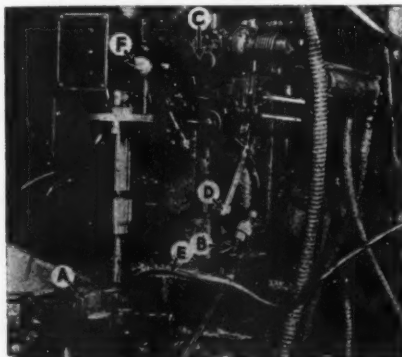
shielded to protect the operator as he loads the fixture.

Notice the effort expended to make chip blowers convenient to use. Chip guns "C" are located more or less permanently by overhead air lines. The rubber hoses give sufficient flexibility to permit their use for almost any fixture location as well as permitting the "broom" effect of sweeping the jet back and forth over the fixture surface to remove stubborn chips. An additional gun "D" is provided for cleaning up the machine at intervals.

### **Automatic set-up on a spindle drill**

. . . is shown in figure 9. The fixture "A" is an air-powered vise. Air line "B" is supplied by the same pilot valve that supplies the air feed mechanism "C". All the operator must do in this operation of reaming the mounting hole in a handle is to drop the part in the vise and press lever "D". The cycle consists of (a) clamping, (b) rapid traverse of the spindle to the work, (c) feed

**9. An air powered vise . . .** Complete cycle, using air, consists of: clamp, traverse, feed, return, unclamp.



**Tiny holes? . . . . . Easy!**

**Accurate holes? . . . . . Easy!**

**Holes on production schedules? . . . . . Easy!**

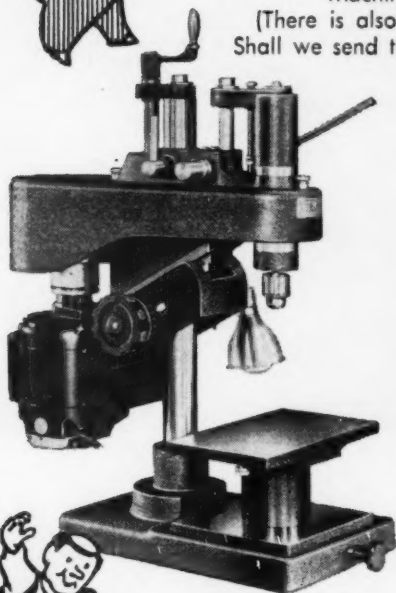
**Tiny, accurate holes on production schedules? . . . WOW!**



Hamilton Drilling Machines can do it!  
And withdraw the drill undamaged  
from hole after hole after hole!

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Write for the series of Hamilton Drilling  
Machine Bulletins and Price Lists.  
(There is also a companion Tapping Machine.  
Shall we send that bulletin along with the others?)



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each particularly adapted to the  
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equally precise.



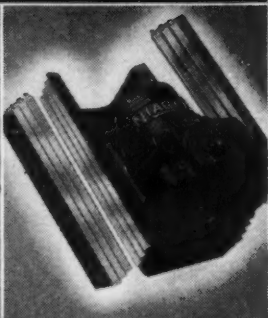
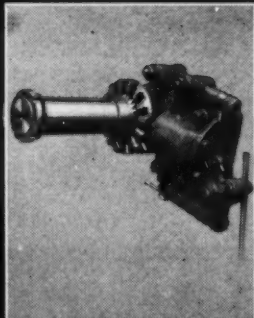


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*Instant Engagement of the Sleeve Clutch as compared with the slower action of other mechanical press clutches produces more work strokes per hour.*

*Multiple "V" ribs provide more guiding surface which minimizes wear, maintains alignment of slide with bed and thus increases die life.*



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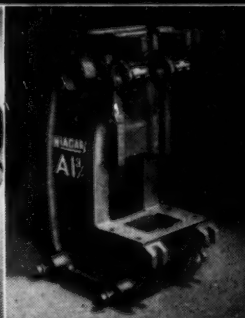
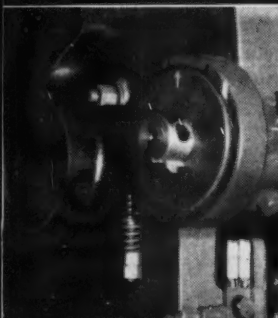
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*Brake automatically compensates for wear as well as expansion due to heat of operation. Drum and band marked to indicate correct adjustment.*

*Slide designed to assure solid backing for die from center to front as well as rear. Breech block die clamp gives solid backing to punch shoe.*

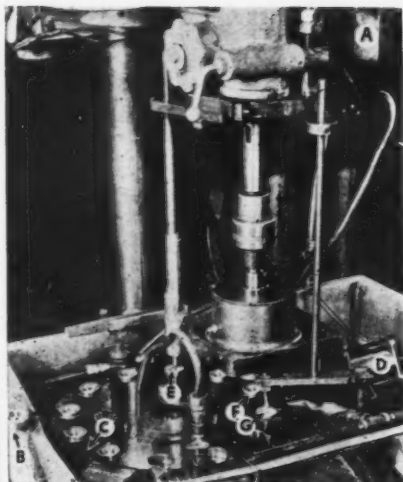
*Frame designed to provide solid gib mountings, strength at the crankshaft bearing and a rigid gap maintaining close alignment of punch and die.*

*Inclining mechanism easily operated by one man. Working height is not materially changed when press is inclined.*



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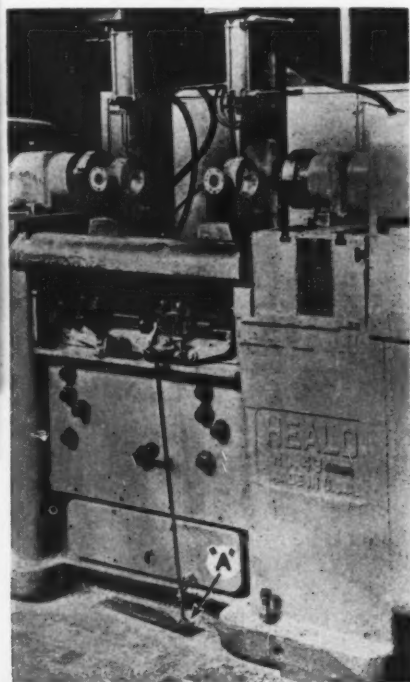


**10. Multiple loading stations . . .** with an ordinary spindle drill to which has been added air feed equipment.

through the work, (d) return of spindle to original position, (e) unclamp part. Knob "F" is a cycle return control. Chips are blown away by air jet "E". If for any reason the operator wishes to stop and restart the cycle, it can be used.

### **Automatic cycles reduce costs and operator fatigue**

In many cases where the basic machine is automatic, the output is increased by special equipment for multiple station loading. Figure 10 is an example of multiple loading stations. While the basic machine was an ordinary spindle drill, the addition of air feed equipment "A" made its cycle automatic. The part "B" is a wheel cylinder piston for an air brake. It is loaded from the left into the indexing fixture plate "C". Indexing is accomplished by a rack and pinion powered by an air cylinder. At station "E" the part is firmly seated by the spring-loaded plunger. At station "F" a facing cutter machines the piston to length and puts a radius on the upper rim. It is clamped at this station by air cylinder "D". The plunger at the next station "G" ejects the part downward into the chute. Both the seating plunger and the ejector are driven by the spindle feed but the ejector requires the lever arrangement



**11. This washing machine gear case . . .** being machined is first mounted on the left side. Next, it is moved to the right-hand fixture where the right side receives the same treatment.

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**TAPPING**  
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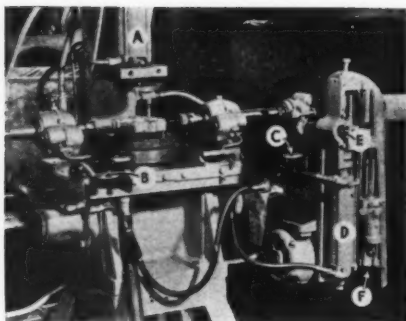
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12. Four holes, 90° apart . . . have to be tapped on this automatic ironer part (an internal gear).

shown to provide sufficient stroke to clear the part from the hole. Although only one station out of 12 is a machining operation, the six stations available for loading make it possible to produce 1500 pieces per hour.

### High production precision boring

. . . is accomplished on this automatic boring machine by the simple two-station, automatic, air-clamping fixtures shown in figure 11. The washing ma-

chine gear case being machined is first mounted on the left-hand fixture for boring, facing and double chamfering the left side. Next, it is moved to the right-hand fixture where the right side receives the same treatment. Foot treadle "A" starts the cycle which moves the table and fixtures to the left, then to the right and back to unloading position where the right-hand part is removed in the finished condition, the left-hand part is moved to the right-hand fixture and a rough part is mounted at the left. About 190 cycles per hour is the production figure for this machine.

### A two spindle tapping machine

. . . designed and built by company engineers, figure 12. The automatic ironer part (an internal gear) has four holes 90 degrees apart to be tapped. Two holes in line are tapped each cycle and then the fixture is hand indexed to tap the other two. To prevent injury to the operator from air clamp "A", the starting cycle is controlled by two levers "B" and "C". Both must be pressed down at the same time. Notice the compact design of the air feed. It consists of a power cylinder "D", a rack and pinion

## THROWING A HERRINGBONE ACROSS YOUR TRAIL

by Professor Herman Reichardt, Consulting Engineer

This Herringbone Speed Reducer Quiz is interesting and you must count 10 points for each question answered correctly. 80-100, you're awarded a gold toothpick; 60-70, a wooden toothpick for you; below 50 . . . buy your own toothpicks.

1. Capacity is increased by **depth of teeth** or taking advantage of **full width of face**. \_\_\_\_\_
2. More effective lubrication is because of **movement of lubricant** or **oil film formed by tooth wedge action**. \_\_\_\_\_
3. **Large** or **small** helical angles are used. \_\_\_\_\_
4. **Side thrusts** or **no side thrusts** are less costly. \_\_\_\_\_
5. Sideway deflections are caused by **side** or **no side thrusts**. \_\_\_\_\_
6. Herringbone teeth are **stronger** or **weaker** than ordinary teeth. \_\_\_\_\_
7. Herringbone teeth are **more** or **less expensive** to produce. \_\_\_\_\_
8. **Medium** or **extra long** ball bearings are necessary. \_\_\_\_\_
9. Maximum advantage is obtainer by **large** or **small** helical angles. \_\_\_\_\_
10. Impact stresses occur with **no side** or **side thrusts**. \_\_\_\_\_

Answers to quiz on page 345.

# THE *Nichols* MILLER

## CONDENSED SPECIFICATIONS

Table Working Surface	6 3/4" x 21" or 30"
Longitudinal Travel (screw or lever)	10" or 19"
Transverse Travel (screw or lever)	7"
Vertical Travel — Knee	13 1/2"
Rise and Fall of Spindle	4 1/2"
Selective Speed Ranges up to 5000 R.P.M.	
Weight	1250 lbs.

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Dollar for dollar, or pound for pound, you can't beat NICHOLS Millers for low initial cost or for profitable adaptability. They handle a complete range of conventional milling, both horizontal and vertical. Versatile Rise and Fall spindle heads can be locked in fixed position—or floated for profiling, broaching, drilling, keyseating, and similar plunge-cutting operations. Rapid lever feeds speed up many lathe-type operations such as turning, facing, boring and recessing.

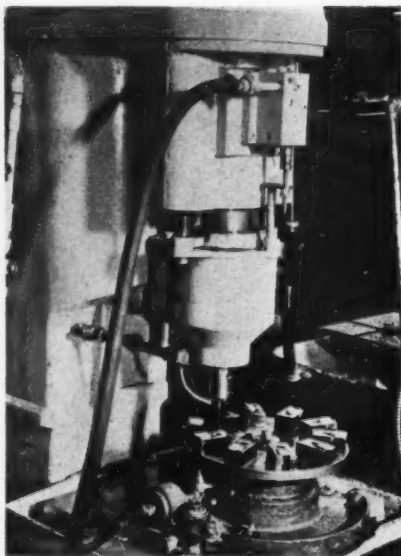
There are lever, screw, and air feed models. Also three types of Double Spindle Millers. All are multi-purpose, work-devouring, uncomplicated machine tools, unexcelled in accuracy and fine workmanship.

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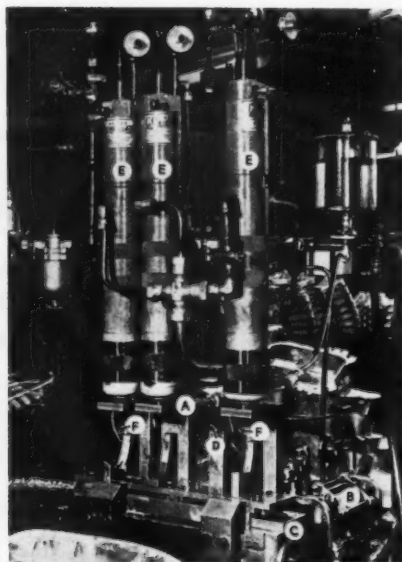
50-8 CHURCH ST.  
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**13. An automatic tapping machine . . .** operated entirely by compressed air. This machine, when used with the universal indexing fixture shown becomes an integrated, air-operated, high production unit.

"E" and a pilot valve "F".

Figure 13 is an automatic tapping machine which is operated entirely by compressed air. This machine when used with the universal indexing fixture shown becomes an integrated, air-operated, high production unit. The air for the indexing table is supplied directly from the control valve of the tapping machine and indexing becomes part of the automatic cycle. The part being tapped is the reel clamp for a well known brand of fishing rod. In spite of the fact that only one hole is tapped at a time, the operator has a choice of nine out of the ten stations for loading and unloading. This feature makes it easy to maintain a production of 1500 parts per hour.



**14. Multi-spindle drilling . . .** is shown. The three drill units are both air-powered and air-fed. At the end of their drilling cycle the part is unclamped and chips are blown away from the locating stops.

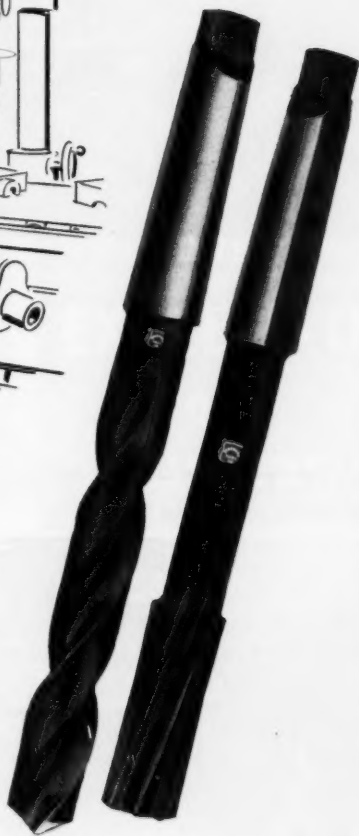
Although the machine tool of figure 13 was purchased equipment, it is quite practical to consider shop-designed, special purpose equipment which is automatic, air-powered and air-controlled. An unusually neat assembly of this kind is the spindle drill in figure 14. The part to be drilled is shown in front of the fixture. After loading the piece, the operator pushes knob "A" which starts the cycle. Air piston "B" operates a rack and pinion jig "C", which raises the part to the stop "D". This clamps the part in position. The three drill units are both air-powered and air-fed. At the end of their drilling operation the part is unclamped and air jets "F" blast the chips away from the locating stops.



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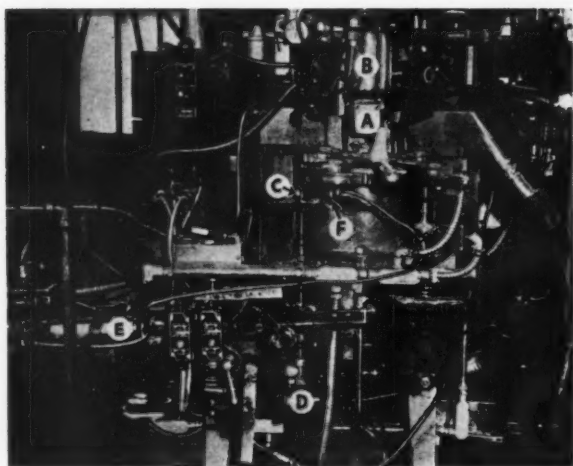
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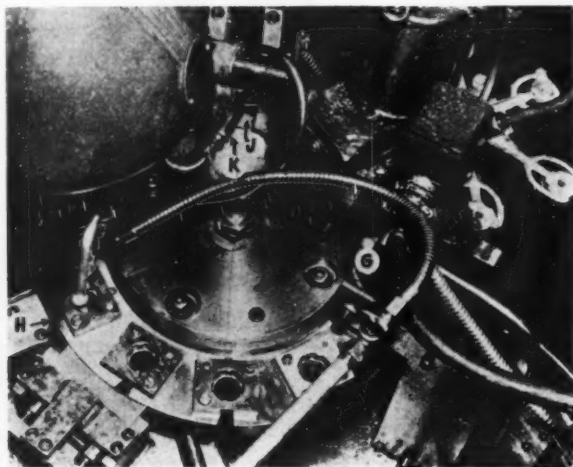
THE STANDARD LINE: Drills • Reamers • Taps • Dies • Milling Cutters • End Mills • Hobs • Counterbores • Special Tools





15. Operator's position . . . of the machine with a gate of castings "A" in the starting position.

16. A top view of the indexing table . . . The gate of castings can be seen at the right.



## Finishes gate of six castings

Figure 15 shows the operator's position of the machine with a gate of castings "A" in the starting position. One of the parts, a shock absorber piston, is inserted into the trimming die station of the indexing plate. Cylinder "B" operates a trimming punch which shears the casting free of the gate and trims the flash from a central hole. At station "3" the hub inside the part is faced from below by cutter "C". This cutter is powered by drill head "D" with automatic air feed "E". The exhaust from the air feed cylinder supplies an air blast through nozzle "F" for blowing chips from the cutter. An air clamp holds the part down against a stop for this operation.

It can be seen more clearly at "G" in figure 16 which is a top view of the indexing table. In this view, the gate of castings can be seen at the right. At "H" an air-powered pawl locks the index plate in position. At this same spot, station "I", a second drill head with air feed performs a facing operation on the top outer rim. Note the air jets to blow away the chips. At station "11", the part is forced upward through



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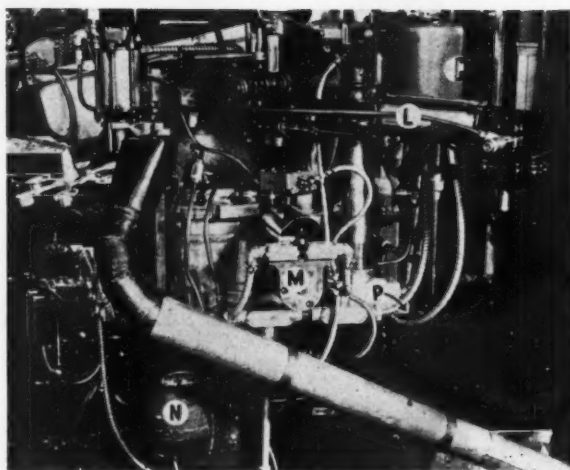
**EX-CELL-O CORPORATION**

**DETROIT 32,  
MICHIGAN**

a die "J", which broaches the outside splines to finished size, and is then ejected. Air jet "K" blows the finished part into the chute where it rolls into a tote-box.

Figure 17 shows the "down spout" for finished parts as well as other important features. The gate of castings at the left indicates the operator's station. Air feed for the drill head at station "7" is shown at "L". Air cylinder "M" indexes the table. Air cylinder "N" pushes the part from below on the final operation. One inch boiler-plate forms the frame "P" of this machine. All the component parts are bolted to this table top with the standard machine legs shown in the picture.

The workmen in the shop call this one the "Merry-go-round". Turning out 6000 pieces in an 8-hour shift, it



17. The "downspout" for finished parts . . . The gate of castings at the left indicates operator's station.

takes the place of four machines. This means saving valuable space as well as efficiency of production.

To supply the air for these and many other uses, the companies described have in use the following air compressors and allied equipment.

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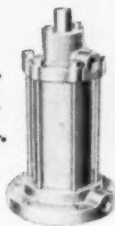
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**WITH FINE-CUT REAMERS**

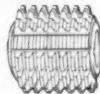


You can ream finishes like this in *regular production* operations with Barber-Colman Fine-Cut Reamers. Many jobs which previously required finishing by lapping or honing are now being finish reamed with these Fine-Cut reamers. All elements for fine finish, accuracy and tool life are provided in the reamer design and application of Barber-Colman job-engineered reamer sharpening.

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## FINE-CUT REAMERS

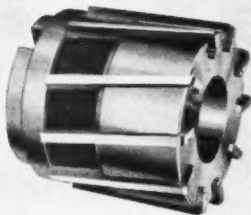
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Send specifications on hole sizing and finishing problems to Barber-Colman engineers. They will furnish reamers to give you the desired quality consistently.



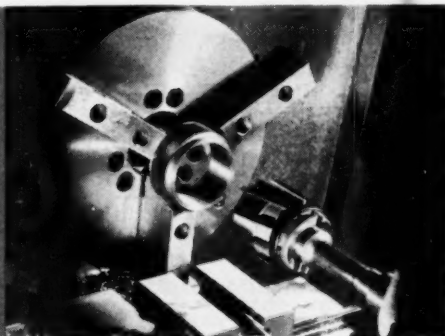
1. Reamer, held in turret lathe float, is fed to work revolving at 170 feet per minute, using .008"-.010" feed. Three thousandths stock is removed in a cut 2.88" diameter and 1-1/8" long.

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# "S"

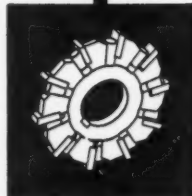
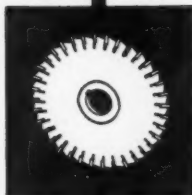
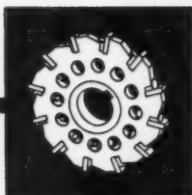
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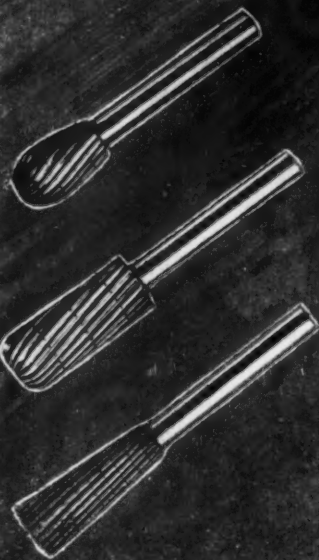
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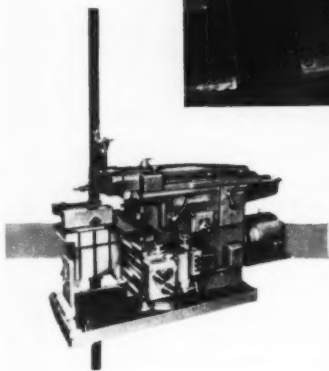
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## **Increase life of hydraulic units for machine tools through care and service**

**By J. Howard Groom**  
Field Service Dept.,  
The Cincinnati Milling  
Machine Co.  
Cincinnati, O.

WHAT ARE the primary causes of trouble with hydraulic units of machine tools? Vickers, Inc., of Detroit asked themselves this question and found the answers by analyzing their service calls to customers' plants. Following are the primary causes of service:

1. 70%—improper condition of the hydraulic oil.
2. 10%—improper diagnosis of trouble or lack of "know-how" in making repairs.
3. 10%—mechanical failures, i.e., bearing failures from misalignment, seal failures due to dirt.
4. 5%—operating units beyond recommended limits of speed, pressures, or volume.
5. 5%—unclassified causes ranging from excessive packing friction on hydraulic rams to chatter resulting from inadequate way lubrication.

Assuming that a hydraulic machine has been demonstrated as satisfactory when delivered, and has operated satisfactorily throughout its warranty or guaranty period, the evidence of this analysis points to this conclusion: 95% of the service problems on hydraulic equipment are within the control of the user.

The most significant of the figures

given in the analysis is the first. It indicates that 70% of the causes for hydraulic service can be traced to the conditions of the hydraulic oil. This 70% can be broken down as follows:

1. Excessive wear due to dirty and abrasive oil.
2. Improper type of oil.
3. Rust resulting from condensation or from using an oil with high water affinity.
4. Lacquer deposits and sludge resulting from chemical or physical changes in the oil in continued use.
5. Lint, whose presence in some hydraulic oils is an undesirable result of the manufacturing process. When suction filters are used, they usually remove such lint, but in so doing they often plug to the point of cavitation. When suction filters are not used, such lint usually accumulates at points of restriction in the hydraulic circuit, and plugs such units as flow controls.

### **Principal factors in oil contamination are . . .**

1. Foreign particles (grit, dust, etc.) drawn through unprotected air vents or air leaks in the reservoir, or through cylinder rod packings.
2. Metal particles, deteriorated paint or



sealing compounds from within the circuit.

3. Physical and chemical changes in the hydraulic oil resulting from long use or from extreme operation conditions.

These points emphasize the need for using the proper oil initially, using a dust tight reservoir with an air filter and an oil filter, and changing the hydraulic oil periodically.

Hydraulic machine tools should be operated on the best quality hydraulic oil obtainable, regardless of price. Most hydraulic equipment manufacturers furnish specification sheets covering a range of physical properties of hydraulic oils which, in general are suitable for use in their equipment.

Hydraulic oils which come within these specifications are not necessarily suited equally to all conditions. Beyond these specification sheets most hydraulic equipment manufacturers, because they are not oil specialists, depend on the oil company representative to recommend the best hydraulic oil for your particular application. A few dollars saved on the initial cost of hydraulic oil may be false economy.

### **Use special care in selecting hydraulic oils**

... because some of the factors encountered in hydraulic systems such as severe service conditions, rusting, contamination, etc., have necessitated the development of oils having certain properties which result in the elimination, or at least minimization, of the adverse effects these factors have on the continued smooth operation of the hydraulic system.

Undoubtedly, the largest single factor contributing to short oil life is oxidation. This is the chemical reaction of oxygen and various components of lubricating oils to form a multitude of chemical combinations, some of which

are oil insoluble. Commonly-termed gum, varnish, and sludge, are examples of this.

If oils fortified with oxidation inhibitors, proven in service to be effective, are used in hydraulic systems and accepted maintenance practices are followed, oxidation will seldom, if ever, proceed to the extent that gumming or sludging will occur.

### **Rusting occurs in a hydraulic system**

... because moisture is present due to condensation from air entering through leaks on the intake side of



"Never before, in the history of this company, has a man as young as you started with a salary of \$25,000 a year. However, in your case we feel it is more than justified by the intelligence and ability you possess as proven by your conversation and bearing. Now go to it, and show us that our judgment has not been wrong," ... "Okay, Dad!"

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pumps, breathing of air through vents in reservoirs, and contamination with other fluids. Such rust may not look serious, yet only one or two flakes of rust passing through precision made pumps and valves can so scratch surfaces that the efficiency of these parts is reduced. All pumps and hydraulic motors should be carefully protected against rust. A scratched piston, for example, may permit an excessive amount of slippage, just as an automobile engine loses compression with scored cylinders.

The petroleum chemist has provided a means of preventing rust formation by incorporating suitable inhibitors which plate out on metal parts, keeping moisture away from the surface. This is a far more practical means for rust control than complete elimination of all moisture from the system, an expensive and unreliable procedure.

### **Impurities will find their way into systems**

... or while repairs are being made if extreme care is not exercised.

Many kinds of contaminants may cause deposit formation in a system. Some of these are cutting oils and coolants leaking into the system; grease gaining entry through packing glands, or on piston rods; atmospheric dust through the breather; surface paints which are not resistant to hot oil; indiscriminately used rustproofing preparations, gasket cements and pipe sealers, to mention the more common types.

The petroleum refiner has done his best to furnish oils with exceptionally high chemical stability to resist the action of contaminants. Even so, the safest course is to follow a proper maintenance procedure so that contaminants do not enter the hydraulic system.

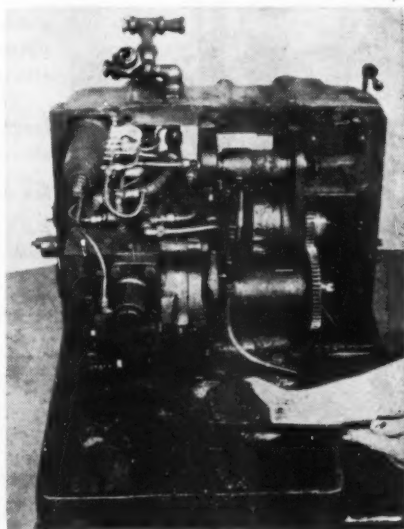
### **Results of neglect**

... can be seen in figure 1, which shows the condition of a hydraulic unit from a bed-type Milling Machine when received by the plant for reconditioning.

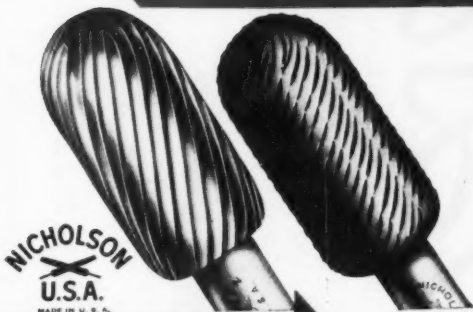
This unit has been in the machine for approximately 15 years and probably has no maintenance or care whatsoever and the oil apparently had never been changed. The amount of sludge or muck in the bottom of the unit was about 2" deep and the unit itself was covered entirely with  $\frac{1}{8}$ " layer of this deposit.

When the unit was dismantled for repair it was found that none of the moving parts could be used at all, they had to all be replaced. The only thing

1. Prevent this condition ... by having regular inspection procedure. This unit was received from a customer for reconditioning; instead the job necessitated a complete overhaul.



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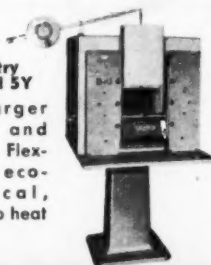
### Sentry Model 2Y

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### Sentry Model 5Y

For larger tools and cutters. Flexible, economical, quick to heat up.



### Sentry Model YP

Vertical model for long, slender drills, reamers, broaches, etc.



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FOR HEAT TREATMENT OF METALS  
"The Sentry Company" ROXBORO, MASSACHUSETTS



Tool up Quick  
...Cut Faster



with



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need tools fast.



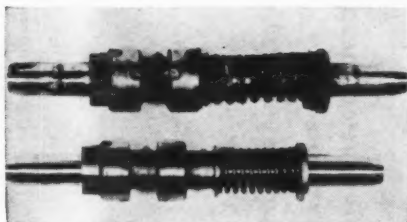
This 28 page booklet shows the complete Allegheny Ludlum line of CARMET standard cutting tool blanks and cutting tools, with specifications. *Write today!*

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## 2. Contamination caused this condition . . .

and contrasts sharply with a similarly new part. Failure of valves and other parts of the hydraulic mechanisms can often be traced to lack of preventive maintenance.

that could be salvaged was the main casting. Some of the actuating plungers were as much as .007 loose in the holes into which they originally had a so-called "hydraulic fit." One hole in the main casting had to be enlarged 1/32" in order to provide a round hole to which a new member could be fitted.

If this unit had been removed from the machine once every two years and cleaned out, this condition probably never would have occurred.

An analysis of the oil and slush showed the oil to be in the "broken-down" stage. This could be due to any one or a combination of the following reasons:

1. Wrong oil used
2. Original oil of poor quality
3. Water in the oil system
4. Contamination of hydraulic oil with other type of oil
5. Failure to make periodic oil changes

After the sludge had been cleaned, 85% of the matter was found to be combustible, leaving a residue of 15% ash, consisting mostly of iron. This iron, of course, being the material worn off the hydraulic valves, etc., due to the poor condition of the oil.

This shows one example of deteriora-

tion of the hydraulic unit due to lack of preventive maintenance, but it is by no means a rare case.

Figure 2 shows a comparison between a new part of a Vicker's valve and a similar part which has been exposed to contaminated oil for a period of time, and again shows the necessity for using the correct oil in the first place and changing it when it becomes contaminated.

The cost of changing the oil is small compared to the down time entailed to repair equipment after allowing it to get into condition as shown in the illustration.

## How to care for your hydraulic mechanisms

1. Use oil as recommend by manufacturer.
2. Change oil as recommended by manufacturer.
3. Change filters as often as recommended by manufacturer.
4. Use clean containers for adding oil to machine, also for storing oil.
5. Use correct pressure, see instruction books, figure 3.
6. Bleed lines of air, when machine stands idle for a long period of time or overnight.
7. If valve binds or becomes sluggish, remove, clean valve and bushing. If this does not correct complaint, determine which is at fault—valve or bushing. If valve, stone off outer edges of any scratch marks with a fine stone; if bushing, make spirally grooved cast iron lapping tool and lap bushing. Use an oil dissolving compound which breaks down and will not injure hydraulic systems (Aluminum Oxide lapping compound—320 grit is used at C.M.M. Co.) Never lap with a lapping compound a valve spool to its bushing, for a high spot on one will cause a low spot on the other.
8. When any hydraulic unit is removed from the machine for cleaning or serv-

icing, make certain that all allied units remaining in the machine are thoroughly cleaned before re-installing the serviced unit. Sludge or foreign matter may be removed from the hydraulic oil lines by employing a solvent or manually.

9. When servicing hydraulic units of any kind, extreme care should be used to make certain that all parts are free from foreign matter such as dust, dirt and lint.

10. Train maintenance men in proper handling and correct method of servicing hydraulic mechanisms.

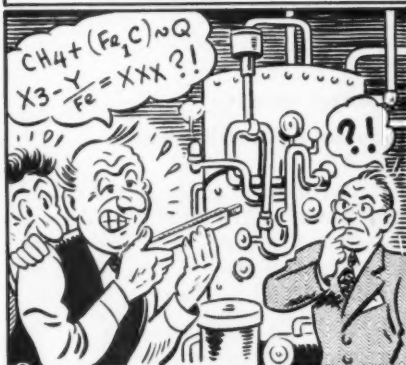
11. A common complaint on hydraulically controlled machines is erratic movement on the various sliding elements. This does not necessarily mean that hydraulics is to blame. Erratic movement of the slides may be caused by any one of the following: **A.** Machine not level or is twisted. **B.** Wrong kind of oil in the lubricating system. **C.** Piston rods slightly out of line. **D.**

Packing nuts around piston rods drawn up too tightly. **E.** Air trapped in the hydraulic system. If this is the case, make certain that all pipe fittings are air tight. In hydraulic systems operating in excess of 600 lbs. per square inch, the pipe fittings can be made air tight by heavily tinning the male threads with solder before assembling. The air may be removed from the system through air bleeders which are provided for that purpose.

12. If possible, assign one man to the job of changing and replenishing the oils in the machine. Instruct him on the importance of cleanliness. He should also be provided with new pails to be used only for conveying clean oils to the machine. Use different pails for removing contaminated oils and coolant from the machine.

13. Never exceed the manufacturer's recommended maximum operating pressure of the hydraulic system.

## WHY DO IT THE HARD WAY?



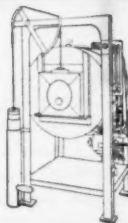
CONTROLLED ATMOSPHERE HEAT TREATMENT CAN BE SIMPLE AND SURE... AND IT DOESN'T TAKE COMPLICATED EQUIPMENT. HOW? USING THE DELAWARE FURNACE-

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### LUBRICATING INSTRUCTIONS AND SPECIFICATIONS

When to Oil	Station Number (See opposite page)	Lubricating Instructions	Parts Lubricated	Lubricant Specifications
Daily	1	Keep filled 1 drop in 5 min.	Headstock bearings	P-31 Medium quality machine oil. Viscosity 190 to 210 seconds Saybolt at 100° F.
	2	Oil with oil can	Footstock spindle	
	3		Footstock spindle	
	4		Swivel screw	
Six Months	5	Use a large funnel, and be sure oil container is clean. About 15 gallons required. Also see additional instructions	Hydraulic and way lubricating systems	P-53 High quality light hydraulic oil. Viscosity 155 to 165 seconds Saybolt at 100° F. Example: Lubeway Oil No. 150, Sun Oil Co. or equivalent
	7	Use a large funnel, and be sure oil container is clean. About 3 gallons required. Also see additional instructions	Spindle bearings	P-45 or P-46 High quality light bodied spindle oil. Viscosity 100 to 130 seconds Saybolt at 100° F. Example: Socony Vacuum Velocite Oil C, Gulf Gem C, or equivalent

**Filter**—Replace at least once a year.

**Strainer**—Strainer located in pressure line of lubricating system (see Fig. 21A). Unscrew strainer and clean if necessary. Wash in naphtha.

**3. Follow instructions** . . . as outlined in Operators' Instruction Manuals as furnished by machine tool builders. In addition to operating instructions, the manuals usually contain lubrication charts and other hints on the care of hydraulic systems.

**14.** Filters should be inspected periodically and replaced when clogged.

**15.** Caution operators about keeping chips from piling up around coolant return drains. Occasionally dams of chips form at these points, which cause the coolant to overflow into the lubricating and hydraulic oil reservoirs.

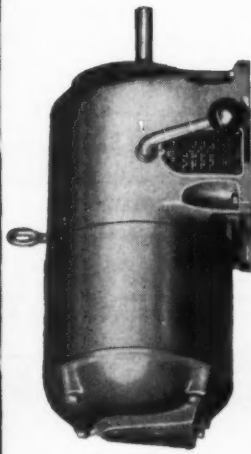
**16.** All machines should be checked periodically to insure long trouble-free operation. Some sort of card system may be used with such items listed as filters, hydraulic pump, oil reservoirs, pipe connections, electrical controls, etc., figure A. If items such as these are checked regularly, they will effect an actual dollar savings in the operation cost of the machine.

### **Trained men to service hydraulic units**

. . . for it is the only way the average shop has of assuring itself trouble-free operation. It is best to train one or more of your maintenance men to handle hydraulics. This may be done in one of several ways.

The machine tool manufacturer usually sends a demonstrator to start up the machine, one who is familiar with the hydraulic circuit of that particular piece of equipment. It is suggested that before leaving the plant the demonstrator should have interviews with the maintenance personnel and, if neces-

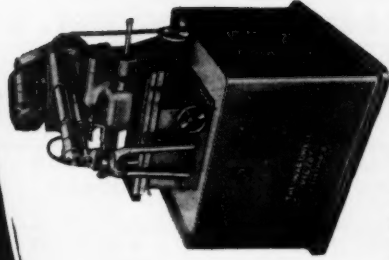
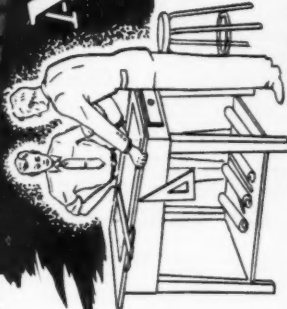
# Selective Speed



LIMA GEARSHIFT DRIVES built with Engineered Accuracy, provide the ultimate in selective-speed power for machine tools and other production equipment. Four and eight speed LIMA DRIVES are available in ratings of  $\frac{1}{2}$  to 25HP with integrally mounted motors or, in motorless types.

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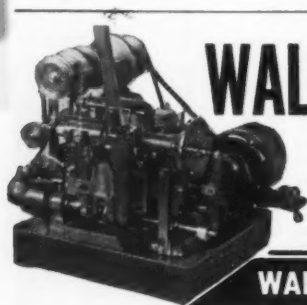
PARTS TO BE OILED	TYPE OF LUBRICANT	LUBRICATED BY	TYPE OF OILER	FREQUENCY
Hydraulic System	Solius Light P39	Machine Repair	Pump	6 Months.
Table Ways and Cross Slides	Tableway P47	Machine Repair	Pump	6 Months.
Spdl. Gear Train	Vactra Heavy	Machine Repair	Pump	6 Months.
Spindle Bearings	Supurla 2X	Operator	Grease Cup	Turn Daily
All Oilers	Red Engine P55	Operator	Oilcan	Daily
All Grease Nipples	Keystone #44	Operator	Gun	Weekly
Filters		Machine Repair	Clean	6 Months

THE MACHINE OPERATOR IS RESPONSIBLE FOR THE LUBRICATION OF THE ENTIRE MACHINE. "DAILY" MEANS ONCE EACH SHIFT. THE OPERATOR IS TO MAINTAIN OIL LEVELS IN ALL RESERVOIRS AND SIGHT GAGES AT ALL TIMES. THE MACHINE REPAIR DEPT. WILL MAKE PERIODIC OIL CHANGES AT ALL STATIONS MARKED "MACHINE REPAIR".

4. Charts aid maintenance man . . . and operator in carrying out regular maintenance and inspection routines. It is best to train a man or a number of men in the care of hydraulic equipment. Such training will pay off in less down-time and in greatly reduced service expense.

sary, with engineers who are capable of understanding the hydraulic circuit and go over it with them and the main-

tenance personnel and acquaint them thoroughly with the hydraulic system of the machine.



## WALTHAM

PINION AND GEAR CUTTING

*Machines*

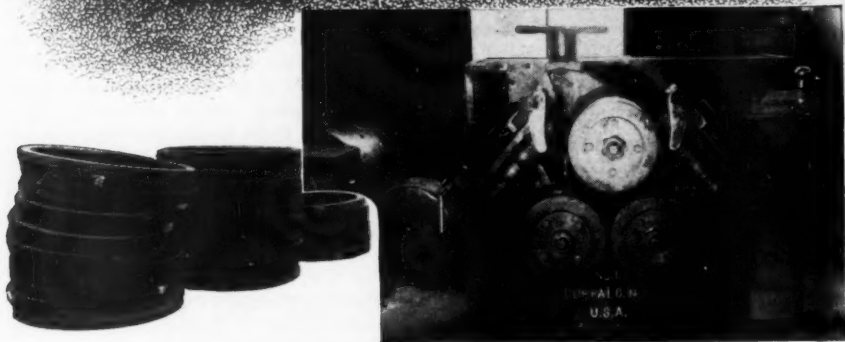
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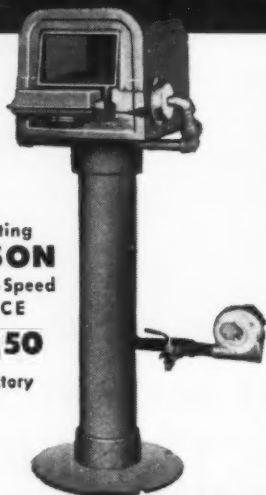
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If electricians are involved, the same thing will be true of electrical equipment of the combined hydro-electric equipment.

Make available to the candidate for the position of hydraulic serviceman literature on the subject which may be very helpful to him.

A practice followed by some users of hydraulic equipment is to send a maintenance man to the machine tool manufacturers' plant for a course in hydraulics in their hydraulic department or training school. This has been found to be very helpful for both the user and the manufacturer of the equipment.

A course in hydraulics might be put on in the user's plant based on the available material. In some cases the manufacturers of hydraulic equipment have cooperated in conducting courses in hydraulics in customer's plants and have sent men to give illustrated lectures with both slides and films. Courses of this kind have been organized on a city wide basis and, sponsored by manufacturers associations, have proved very helpful.

The author acknowledges, with thanks, cooperation from the following: M.H. Hayden, Vickers, Inc.; A. S. Morrow, Shell Oil Co., Inc.; A. F. Brewer, The Texas Co.

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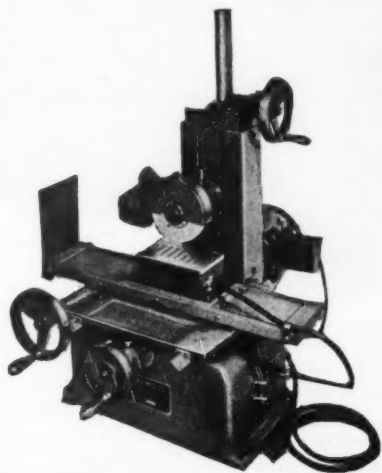
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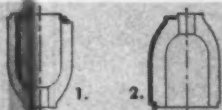
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## 1-SPINDLE MACHINE

- No. 1 — on one spindle
- No. 2 — on other spindle

PART—3" dia. shell

— No. 1 —

Operation — Contour bore I. D.  
Turn step on O. D.  
Face open end

Estimated production — 137 per hr. @ 100%

— No. 2 —

Operation — Contour turn O. D.  
Face other end

Estimated production — 137 per hr. @ 100%

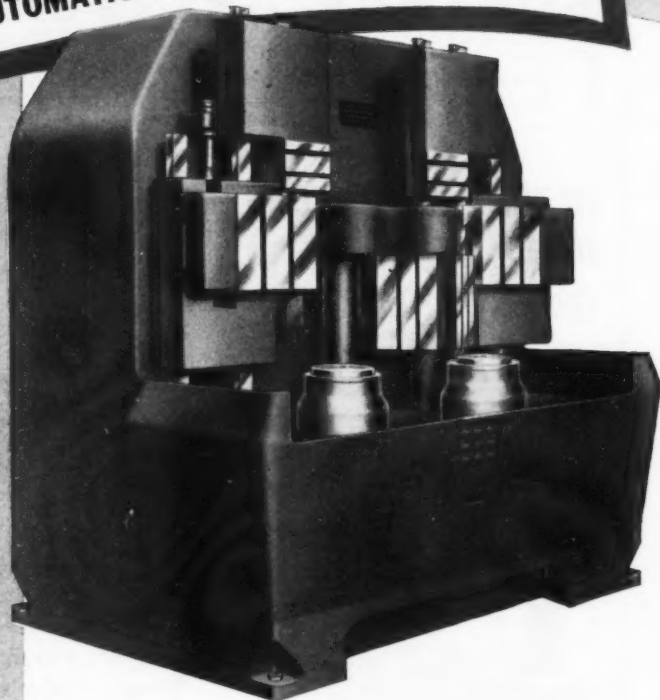


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Same operation on both spindles

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## An interesting workpiece aligning feature

by Robert Mawson

When machining holes in a piece with a drill jig it is sometimes advisable or necessary to move the workpiece into a certain relative position in order that the holes which are produced will occupy a predetermined location. This condition arises when the machined holes must coincide with holes or surfaces which have been already produced on a contacting unit. To achieve this objective and also have the smallest percentage of lost or unproductive time the feature which obtains the de-

sired alignment should operate quickly and positively.

The illustration figure 1 shows a Lead Screw Nut made of bronze, which is one of the details used on the Hydraulic Shapers manufactured by the Rockford Machine Tool Co., Rockford, Ill. The sequence of operations when machining this detail are:- 1—Rough turn, Face, Drill and Tap. 2—Finish turn on threaded arbor. 3—Drill. 4—Burr and Inspect. These details are machined in job lots of twelve or less.

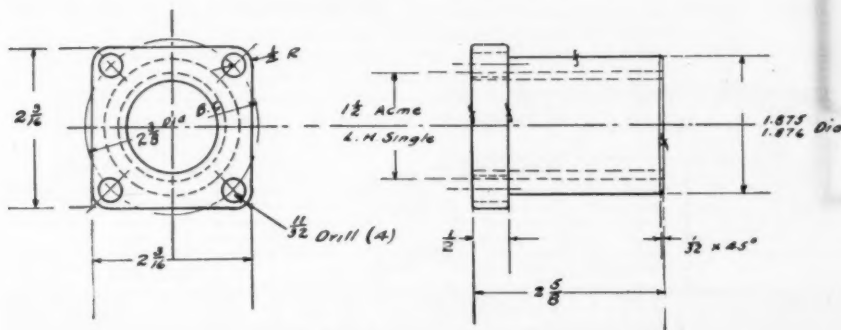


Fig. 1.

The drill jig used when performing the third or drilling operation is illustrated in figure 2. This jig is made with a machine steel body (1) rough machined all over and then finished on the faces "f" to obtain parallel surfaces. Between machined surfaces in the jig body is located the machine steel, case hardened, workpiece locator (2). The sides of this detail are machined to be a good sliding fit between the vertical walls of the jig body. The locator rotates on a steel pin which fits in reamed holes in the jig walls and the locator.

At the right hand end of the body is attached, with two filister head cap screws (4), a machine steel end plate (5). In a drilled and tapped hole in the end plate is a square head set screw (3) positioned to contact the face of the locator. On the upper surface of the jig body is located a machine steel bushing plate (8). This detail has been machined to be a good sliding fit between vertical ears at each end of the

jig body. The bushing plate rotates on a hardened steel pin (6) which is placed in accurately drilled and reamed holes in the jig ears and bushing plate.

At the opposite end of the bushing plate is a steel locking screw (9) which is threaded into a tapped hole in the jig body. The bushing plate is provided with a machined slot so that the plate can be rotated out of the machining position without removing the locking screw from the jig body.

Four holes are accurately machined in the bushing plate in which are inserted tool steel, hardened and ground, bushings (7) each with a hole suitable for guiding a 11/32 inch drill. In the plate are also placed two steel set screws in the correct positions to contact the workpiece when placed in the drill jig. A hole is carefully bored through the jig body to be a good sliding fit for the 1.875-1.876 body of the workpiece and in the correct relative position for the bushings centers.

To use the drill jig, the locking screw (9) is first moved in the slot until the bushing plate (8) can be rotated to the open or non-machining position. One of the workpieces, to be drilled, is then placed in the bored hole of the jig body. The screw (3) is now screwed in contact with the locator (2) and this action brings the locator against the flange of the workpiece. As the screw is moved in the lugs on the locator bring the workpiece into the correct alignment for the drilling operation.

The bushing plate (8) is next rotated

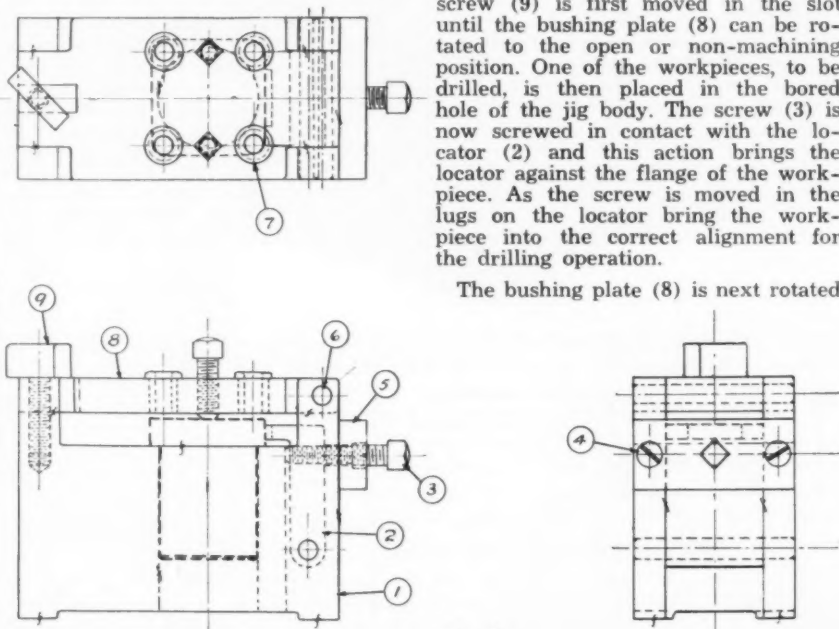
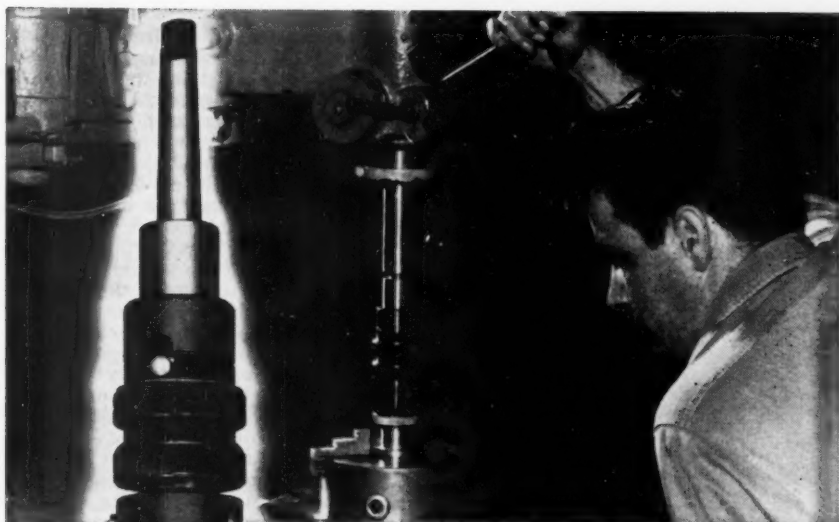


Fig. 2



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Cut location made from either top or bottom surfaces. Ball-bearing pilot facilitates use of Series "R" Recessing Tools with existing fixtures. Without fixtures, ball-bearing pilots will stop on workpiece surface to accurately locate cutter.

Hardened tool-steel wearing surfaces guarantee maximum tool life. Cutting action is smooth and requires only finger-tip feed pressure. Series "R" Recessing tools are regularly furnished having cutter ratio of either 1:3 or 1:1. Hole in tool block permits flow of coolant or lubricant to cutter.

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Precision boring with MAS-TUR heads is described in catalog PBH. These inexpensive tools feature large capacity, adjustability and accuracy. Specifications are charted.



Production Boring with the E-Z set line of Boring heads is subject of catalog No. 30. Complete line of tools is shown. Prices, capacities and specifications are charted for reference.



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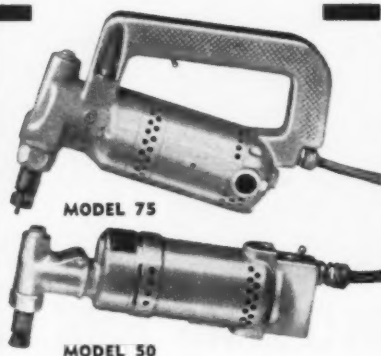
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into the machining position and then fastened with the locking screw (9). The two set screws in the bushing plate are then tightened onto the upper surface of the workpiece to hold it securely in position. The drill press is then started in motion and the four holes in the piece are machined, the drill being guided through the bushings (7) in the conventional manner.

To remove the finish drilled piece it is necessary only to screw back the three set screws to remove the pressure from the workpiece. The locking screw (9) is next moved to the slot in the bushing plate which then can be rotated to the open position and the piece can now be lifted out of the jig. This tool has interesting features of good tool designing, it locates and holds the workpiece accurately and positively and this is done by the use of only one quick-acting feature. The drill jig can therefore be considered an efficient production piece of machining equipment.

### **Lubricate red hot bearings**

by W. F. Schaphorst, M.E.

Believe it or not, red hot bearings are now being lubricated. The operator of a ceramic plant used kiln cars which remained in the kilns for more than 20 hours. The bearings, of course, were lubricated before the cars were shoved into the kilns, but after 20 hours the bearings were usually badly coked and often the wheels were actually "stuck" so that they would not rotate due to the carbonized oil.

The objection to most lubricating oils for applications of this kind is that they behave precisely as described above. They are unable to endure a temperature of more than about 400 deg. F., for a period of time without "gumming up the works," as one workman expressed it.

So the laboratories got busy and developed a petroleum product which would "disappear" without leaving a carbon residue. It disappears very slowly, even under high temperatures, but disappear it does. But, for such extraordinary service as bearings in kilns, collodial graphite is added to the above disappearing oil, so that, after the oil

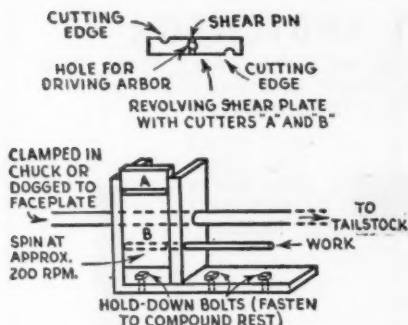
has disappeared the graphite remains and does the lubricating job even after being in the kiln for 20 hours. The bearings remain clean at all times, non-sticking and lubricated. Metal-to-metal contact is prevented.

The disappearing oil itself, without the colloidal graphite, will take care of hot bearings up to and including 625 deg. F., so this writer is informed, which alone is an achievement worthy of mention.

### Cutting several gross of short, round pins

George F. Burnley, Oakland, Cal.

Many times, in the maintenance or repair shop, it is necessary to cut several gross of short, round pins of small diameter. While this job can be done by making a hand cutting shear or some kind of fixture to do several at once in a power saw, it may also be rapidly done in an ordinary lathe as follows:



Weld together a double-faced angle plate as shown in sketch, making provision to anchor same in tool post slot of lathe compound rest. Installing the fixture in the lathe, drill and ream it to a standard boring bar size, and drill hole to feed in stock. Finally, as shown, make the shearing plate and press the bar through the shear with these pieces assembled within the double angle plate. Operate slowly.

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## How to measure for a gasket

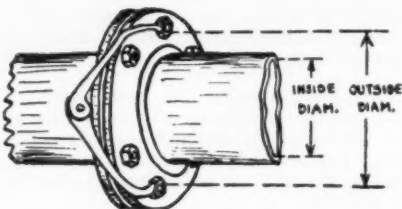
by W. F. Schaphorst, M. E.

Contrary to the common belief, it is not necessary to take a flange apart in order to measure for a gasket. Measurements may be accurately made from the outside as indicated by the accompanying sketch. By means of a pair of calipers take the distance from the inside of one bolt to the inside of the bolt diametrically opposite. This gives the exact outside diameter of the gasket.

For the inside diameter, either measure the inside diameter of the pipe, as shown, or consult a handbook giving the inside and outside diameters of standard pipe. The table will give the exact inside diameter. The inside diameter of the gasket should be the same as the inside diameter of the pipe so that no water or gas pockets will be formed.

The above method is better and

quicker than the one usually recommended, namely, to measure from cen-



ter to center of the bolts and then subtract the diameter of the bolt. No error can be made if the above method is followed.

When ordering a gasket it is usually best to give the "exact" dimensions, particularly the exact distance between bolts, so that the manufacturer can furnish a gasket of the correct size. He will probably deduct  $1/32$  or  $1/16$  of an inch. It is better to leave the deduction to the manufacturer than to do it oneself.

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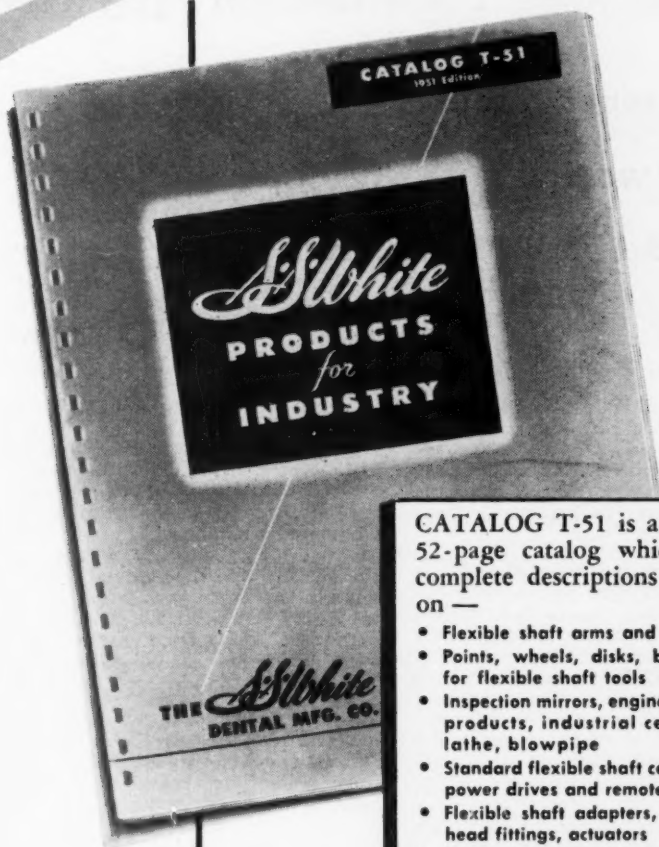
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FOREMANSHIP FORUM • FOREMANSHIP

FOREMA

## **To get most out of women workers**

### **. . . understand their five basic desires**

by Edmund Mottershead

AS THE CONTEMPORARIES and imitators of Sherlock Holmes used to say: "Look for the woman." Only today, instead of being the source of trouble, women all over the country are providing the answer to industry's problem of manpower.

I am not so much concerned with the specific tasks which women can do best, or with the number of women now employed or training for various jobs, as with some of the factors which employers in both large and small plants should consider when hiring women. As far as any measurable characteristics are concerned, there seems to be little difference between men and women as regards brains or ability. The differences are cultural and psychological, and in large part result from our own social and economic system.

What have women to offer industry? There are three main aspects to consider: technical, physical-mental, and psychological.

By training and experience, women were fitted for only 27 of the 625 occupations listed as essential to war production as of April, 1942. By the end of World War II, women were engaged

in nearly 260 of these occupations. Previous to that time, women had found employment largely in the white collar and service fields. This deficiency in technical skill and experience was for the most part solved through pre-employment training, training on the job, and by de-skilling the jobs within the plant so that the learner could more quickly get up to production on a job requiring less skill. These same techniques are being used in many plants today with good results where women are employed.

Physically and mentally, women offer but little different problems from men . . . with one or two exceptions. Heavy work is out for them, except for the relatively rare husky woman who may be put to work on some heavy job. Mentally women seem to have more patience and more capacity for taking pains than men, which fits them for the monotonous repetitive jobs. A greater nimbleness of fingers in many cases suits them for small operations as well.

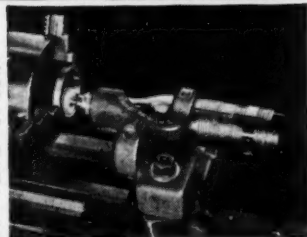
Physically, then, most jobs are suitable for women except the definitely hazardous or strenuous. Mentally, women can handle any of the jobs, with particular abilities in those requiring

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## PRECISE GRINDER-MILLERS

finger dexterity, patience and carefulness. Psychologically, women present a different problem from men to the industrial executive. Let's see why.

Psychologists tell us that the basic motives of mankind spring from failure to adjust our basic desires with out environment. In other words, from maladjustment. Such maladjustment results in compensations or reactions. From this process come the five basic drives of most men and women: 1. self preservation; 2. the desire for recognition and/or a sense of power and importance; 3.

identification; 4. projection; 5. rationalization. What do these drives mean to the executive who has women workers?

### Self preservation is more than saving their skins

... or keeping alive. In most cases it means preserving her home, helping her family. A very strong appeal can be made to the woman worker on this basis.

Because of this desire, women can

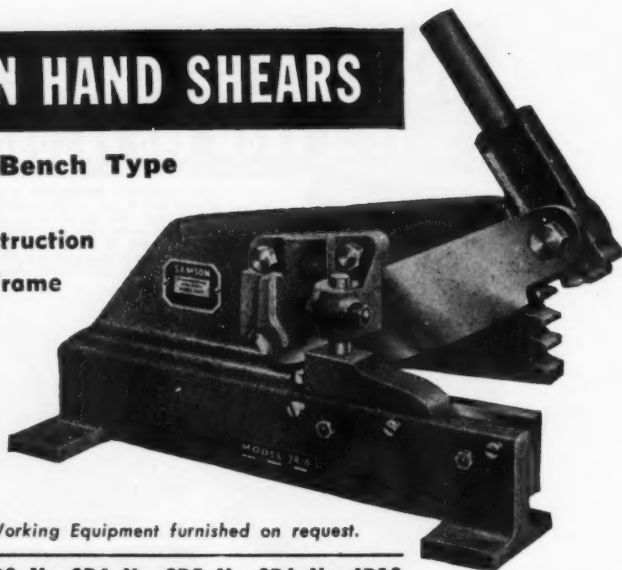


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Cuts sheet or plate up to	14 ga.	1/8"	3/16"	1/4"	5/16"
PRICE	\$16.45	\$23.80	\$30.15	\$68.50	\$104.20

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often be put at tasks which are perhaps less desirable from a man's point of view. They for the most part take jobs temporarily, believing fundamentally that sooner or later they will get married or will quit when their family no longer requires their financial support. This of course does not apply to the few "career women," who are in the minority.

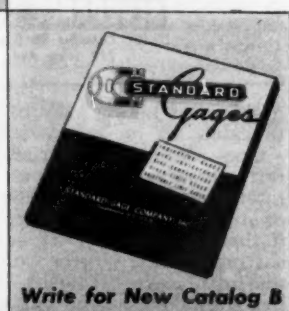
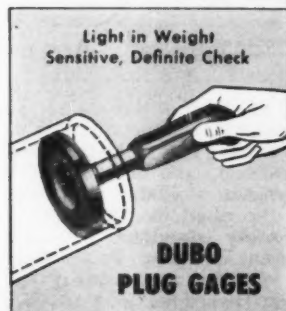
One result of this fact is that there is usually a higher rate of absenteeism

among women than among men. Whether a woman is living in her own home or by herself or with her parents, when a member of the family is ill, she will tend to stay away from her own job until the condition is settled. Women will take time off to shop and to do other things that men will not ordinarily do during working hours. Married women will likely have a higher absence rate than unmarried women. There is also the not-so-small

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THE POPULAR  
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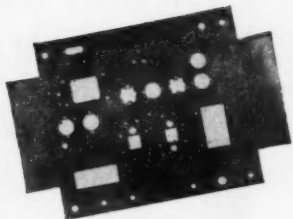
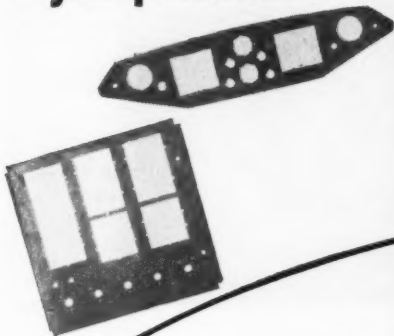
problem of taking time off from work to catch up on housework.

One other factor arising from the self preservation motive is woman's interest in her own health. A number of studies have been made to determine if there is any physical or psychological impairment among women workers due to periodic ill health. Every study has shown that there is no impairment of visual acuity, steadiness or of any of the abilities required on precision jobs. It is true, that many women are

incapacitated for half a day or so, or are at least very uncomfortable, and it is important to have rest room facilities, a medical cabinet, and if possible a nurse or physician available as a routine part of the plant health program.

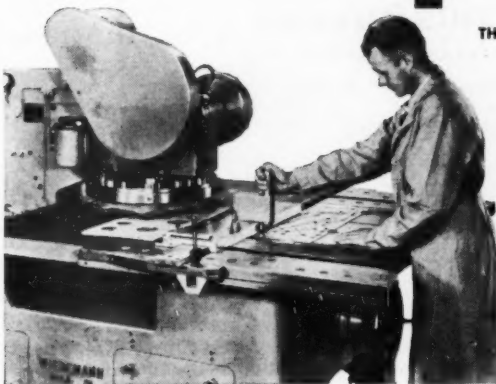
From a safety standpoint, women present no great difficulty. In the first place, many of them are normally assigned to non-hazardous jobs so that the accident rate for women is naturally lower. In the second place, women as a whole are still relative newcomers to

if you produce...



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Bulletin 241 describes the most efficient method of producing chassis and similar work in short runs and semi-production runs. Repeat runs of 5 to 1,500 pieces and single runs of 50 to 5,000 pieces are economically produced on the Wiedemann RA-41P. Write today for bulletin 241.



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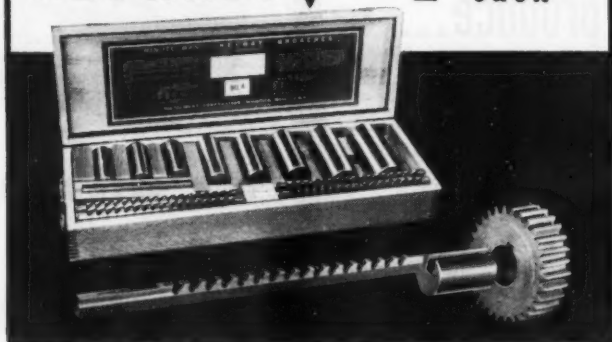
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machinery, and the typical newcomer finds the job new and strange and is inclined to be more careful than the old-timer. It is well recognized that most industrial accidents involve the older and more experienced worker who has a moment of carelessness. However, certain things have been found necessary as safety measures with women. Uniforms, to eliminate loose clothing such as sweaters and skirts, caps or bandanas to eliminate loose hair. And as needed on various jobs,

goggles, respirators, etc. . . . which would be standard equipment, we hope, with either men or women.

### Consider women's desire for recognition

. . . or a feeling of power will probably do more good than any other single thing. Perhaps one thing that gripes women workers more than anything else is the patronizing and condescending air that is sometimes shown by men . . . that it is something unusual for a

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Material	Steel Forgings Rc 30-36	Steel Forgings Rc 30-36
Stock Removal — Valve Face	Rough & Finish Grind .014" in TWO passes	Rough & Finish Grind .014" in ONE pass
Stock Removal — Stem	.004" - .006" in TWO passes	.004" - .006" in ONE pass
Average Production Per Wheel Dressing	Stem — 350-400 Face — 300-350	Stem — 2000 Face — 1200
Total Wheel Life	One Week	Eight Weeks

Write for literature and ask to have a D. A. Stuart Representative call.

**D. A. Stuart Oil Co.**

2749 S. Troy Street, Chicago 23, Ill.

woman to do a job as well as a man. The supervisor who is surprised when a woman does something well, who more or less says to himself: "Huh, and she's a woman too," has much the attitude of a fond and foolish parent over a five-year-old child who said something cute. Few things are more aggravating.

Women want an understanding attitude, on an equal basis as **workers** . . . not to be thought of as women. If incompetent, they would rather be told

that their work was not up to standard than be looked down upon because of their sex. If competent, they want their work recognized and their ability admitted without regard for their sex. Women will always work better for the supervisor who respects their ability and is willing to admit it.

Another simple thing coming under the heading of the desire for recognition is the matter of names. If the supervisor can't remember who is Susie and who is Mamie, he may still be able

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These cam-action clamps were designed for applications where parts (such as castings, larger forgings, or stacked stampings) having variable thickness, are to be held. They are the only big cam clamps known that provide convenient means for locating the spindle assembly along the toggle bar. The spindle itself is easily adjusted for clamping height, and can be replaced by a special pressure pad to suit other clamping requirements.

## **MODEL CAV-1200**

Recommended force at end of toggle bar: 1200 lbs. Recommended force 3 1/4" from front of base, 1900 lbs.

## **MODEL CAS-1200**

This clamp has the additional advantage of permitting the toggle bar to be swiveled around the base to any position within 180°

## **MODEL CAS-2000**

This clamp has the same features as Model CAS-1200, but for 2000 lbs. clamping force.

**MODEL CAV-2000**—similar to above but has fixed base.

This entire series is also available without cam action (with fixed locking). Catalogued as Models V-1200, S-1200, V-2000, and S-2000. Complete catalog sent on request.

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**LAPEER MFG. CO.**

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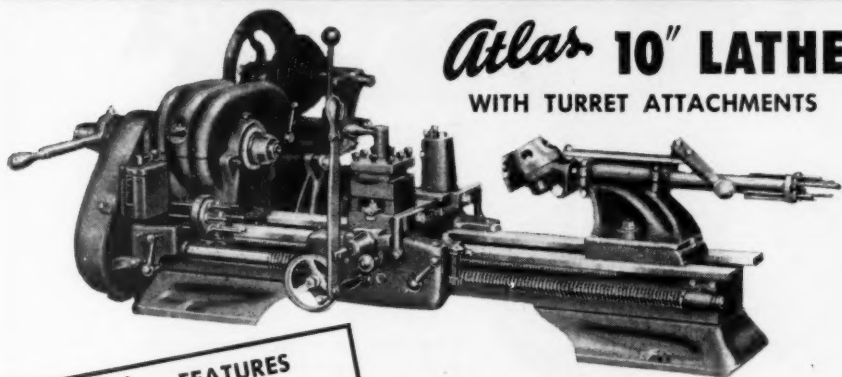
**WESTERN DIVISION: 422 Magnolia Street, Glendale, California**

to issue orders and get results. But maybe Susie doesn't like Mamie . . . and in any case people resent having their name miscalled. And while the department head may have from a dozen to several hundred names to remember, and the worker has only one . . . the supervisor's . . . the worker doesn't think of that.

Labor turnover is another factor which is influenced by this desire for recognition. Because of the basic reasons for which women take jobs in the first

place, they are less inclined to change from one plant to another than men . . . except during their first few days in the plant. Good supervision, giving them proper treatment, will hold them at less interesting jobs and reduce labor turnover. It is especially necessary that women workers get plenty of the right kind of attention during the first few days they are in the plant. First impressions count for a lot. A friendly atmosphere combined with the good physical surroundings outlined above

# FOR HIGH PRODUCTION OF SMALL PARTS - *At Lowest Cost!*



## *Atlas* 10" LATHE WITH TURRET ATTACHMENTS

### *Atlas* FEATURES

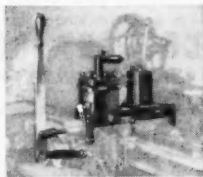
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This assembly replaces the standard screw feed for faster operations on forming, roughing, finishing, chamfering, and cutting off. The four-way tool post turret is released by convenient lock handle and rotated to any one of four operating positions, automatically indexed. The back-slide tool post permits a fifth operation.

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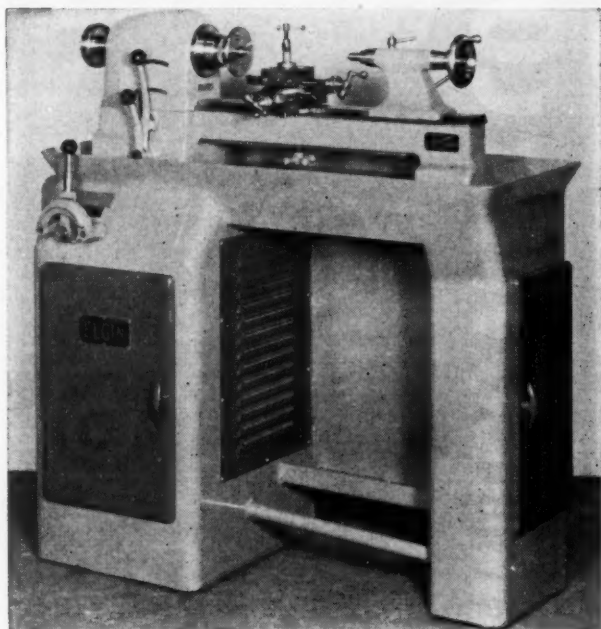
will make the difference between constant rapid turnover and holding workers who become more valuable as they gain experience.

Promotion incentives offer another opportunity to satisfy the craving for recognition. However several things should be remembered. Fundamentally, women seem to work better under a male boss than under another woman. This limits the jobs to which they can be promoted for the best interests of the organization. Minor supervisory

jobs, of course, are open. Different tasks with greater compensation offer some opportunity for promotion incentives. But possibly the best opportunity for female worker advancement is to that of instructor. Not only is this position obviously an advance, but women learners seem to get the hang of things faster from a woman instructor. Women's greater attention to detail, greater patience, perhaps makes this difference. Personally, I feel that women coming up from the ranks of workers

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2. Production efficiency has increased 22%.
3. Die breakage has decreased at least 86%.
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We consider Protection one of our greatest production assets."



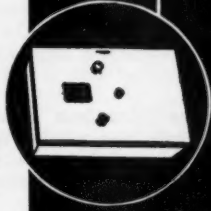
JOHN J. NOWICKI, PLANT MANAGER

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Industry's great need is for preventive maintenance and Protection gives just that. Protection prevents costly die and machine breakage ... cuts "down time" ... Senses oversized or overhard stock, pile-ups, misfeeds, faulty lubrication ... Automatically trips machines at the slightest sign of mechanical overload ... before damage occurs. Lengthens tool life up to 300%.

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make better instructors because they are closer to the problems of the learner . . . they have more recently puzzled over the same things, found the same answers, conquered the same obstacles. And above all, women instructors are usually devoid of the patronizing attitude which a man can so easily have in dealing with a female learner.

### **Identification with some group which has social approval**

You are an American and proud of it because Americans are wonderful people

. . . and also Americans are wonderful people because you are an American. It is represented by "keeping up with the Joneses." All of the "girls" belong to the club . . . so you must belong too. Every woman conscientiously tries to get herself a crazier hat than the next woman . . . just ask any man . . . so that femininity is happy by being almost universally different as to hats. Men, as a group, tend to stick to the darker and more conservative colors in clothing because they want to be as

# Specify *American* Broaches

For the best results  
use American broaches  
— whether you broach  
keyways or drive gears.

## BROACHING MOTOR COUPLINGS WITH AN AMERICAN STANDARD KEYWAY BROACH

A simple operation yet requiring accuracy is the production broaching of keyways in motor couplings.

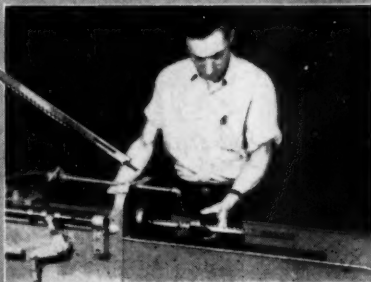
In this tooling set up the operator is not required to remove the American keyway broach from the pull head as he threads the part over the broach onto a work horn. High production is obtained as a part is loaded on each return stroke.

Whether your problem is keyways or complicated involute splines, American broach engineers can design the proper broach to produce parts to your requirements.

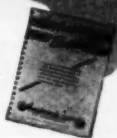
## FINISH BROACHING AUTOMATIC TRANSMISSION DRIVE GEARS

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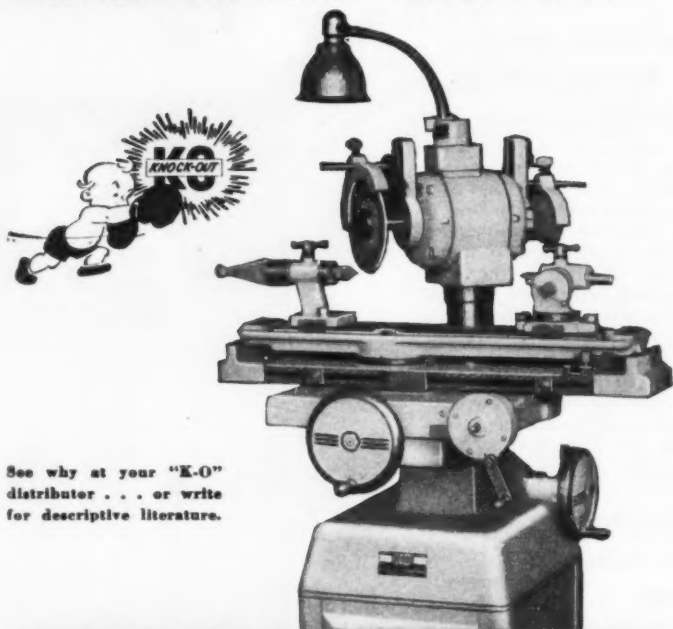


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**ABERDEEN, SOUTH DAKOTA**

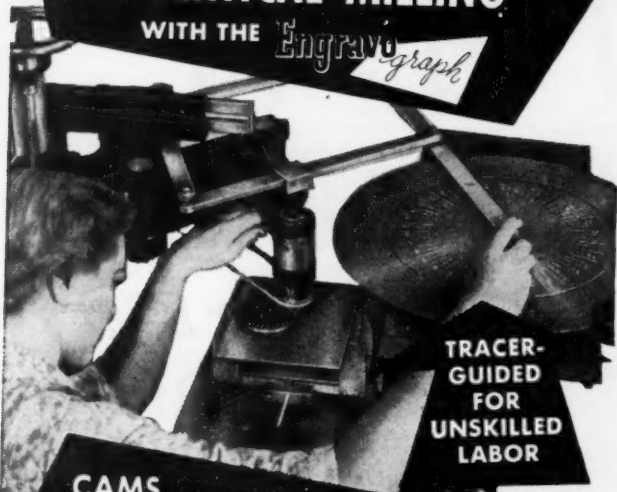
alike . . . not noticeable . . . as possible  
and yet think in terms of good grooming  
and dressing well.

Identification is one of the more pec-  
uliar compensations which make up  
the basic motives of men and women.  
It is to blame for a large part of our  
tastes and habits and social manners  
and customs. What does it mean in  
terms of women workers?

For one thing, it brings on the prob-  
lem of cliques. If cliques can't be  
avoided, at least keep them together

so that among a given group there is  
as little friction as possible. It means  
that national or racial groups, for ex-  
ample German and Polish workers,  
should not be mixed if it is possible to  
avoid it. It means that religious groups  
should at least have special considera-  
tion in the matter of special holidays.  
It means that different home and edu-  
cational backgrounds should not be  
mixed any more than necessary . . .  
those with high school education or  
better, naturally set up distinctions be-

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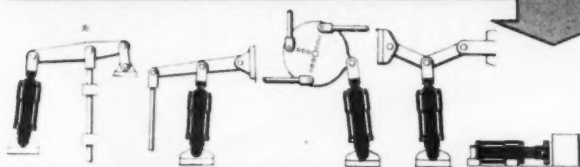
tween themselves and those with less education, with a feeling of superiority on one side and of resentment on the other.

For another thing, consider the problem of clothing for women workers. General experience indicates uniforms, but the personnel director or safety man would do well to consult the ladies as to color and material and even basic design before spending a lot of money. Women in the first place are wise as to fabrics, cleaning, wearability,

etc., and in the second place, will cooperate in the use and care of uniforms far better if they have some chance to look "decent" at the same time. A visored cap of one design may satisfy safety requirements but be murder on the hair-do, while a little forethought can satisfy everybody. Further, uniforms, badges and the like build soundly upon the identification motive by giving the women workers a sense of unity with their surroundings, a sense of "belonging."



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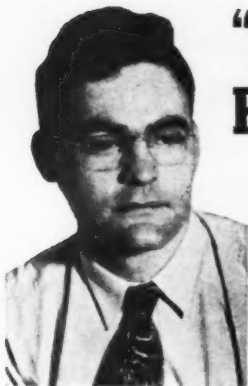
1765 Elston Avenue, Chicago 22, Illinois

**Projection: process of fattening  
the ego at the expense of the  
other fellow**

Projection is the basic psychological compensation which accounts for the familiar holier-than-thou attitude. The classic example is that of the elderly judge, who as a youth sowed his wild oats in all directions, but who as the aged jurist is first to see the human weakness in everybody and be suspicious of everything.

As it concerns the woman worker, projection manifests itself in two very useful ways: there are numerous highly repetitive and relatively high speed jobs which women can do better than men . . . and enjoy doing "better than men." Combined with the typical housekeeper's disposition, it fits women admirably for inspection tasks of great precision, as they are not only using their patience, but are also making the other fellow toe the mark.

The existence of this psychological



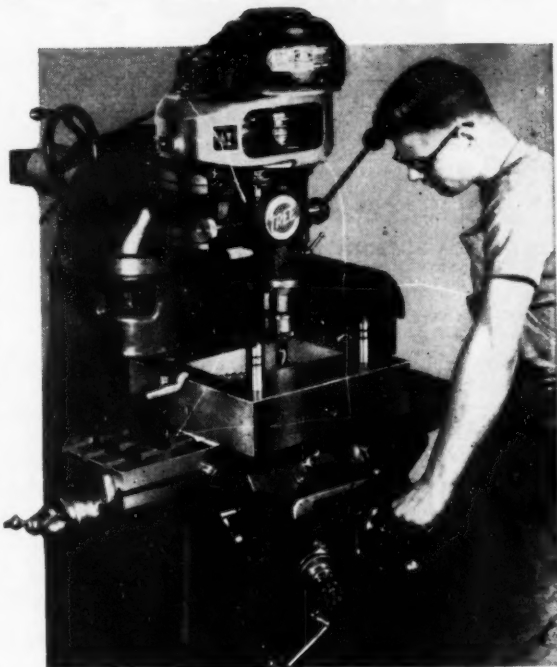
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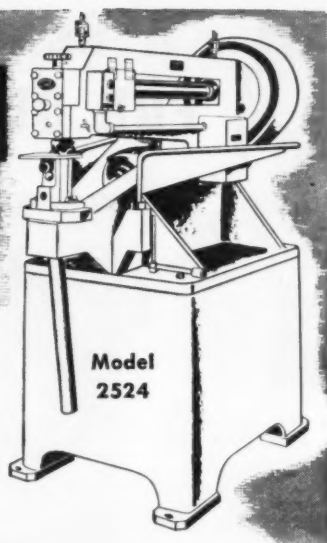
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force of projection is also one of the fundamental reasons which make women work better for a man supervisor who has an understanding attitude. It eliminates any exercise of bossiness on the part of a female supervisor, and from the workers' point of view, the boss is after all "only a man."

### **Rationalizing, or justifying oneself to life**

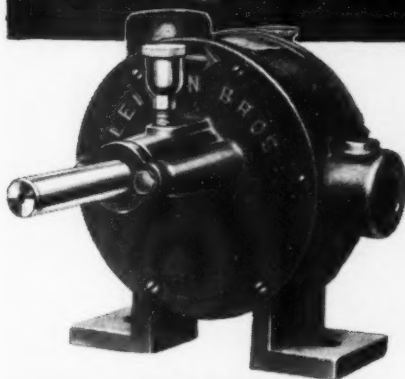
Psychologically, rationalization ranges from what is commonly meant by the

word when applied to someone making excuses for unreasoned conduct to the highly abstract thinking of Einstein. It is simply the process of making life reasonable to oneself... of making life plausible.

For the woman worker the process of rationalization works most of the time, and manifests itself in an almost universal desire to know "why" as well as how. The facts of the job must be made clear and must also be integrated with the work in the plant as a whole.

# Design with AIR!

# Pressure Vacuum Suction



## Handle all these jobs!

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COUNTLESS jobs are done faster, simpler, less expensively by using pressure, vacuum or suction provided by Leiman Air Pumps. Air is the only reliable, trouble-free solution to many operations. Learn more about the great possibilities of designing with air. Leiman engineers offer over 60 years' experience with thousands of air applications. Outline your application for recommendation and suggestions. Write for data outlined below.

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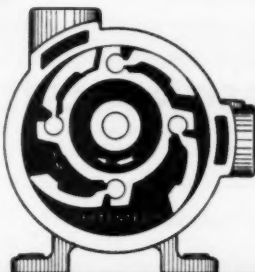
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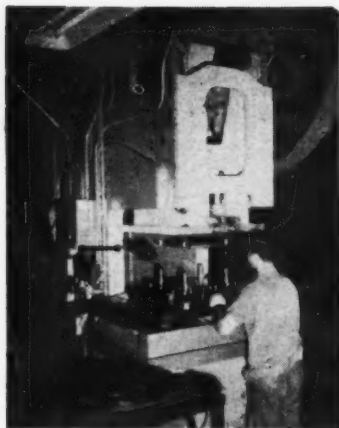
Exclusive Leiman hinged wing design permits wings to wear uniformly, maintaining full pressure or vacuum, after 15 and 20 years' steady service.

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**Verson**  
**OPEN BACK**  
**GAP PRESS**  
**blanks 30**  
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**machine**  
**side frames**  
**per minute!**



With this 150 ton Verson Open Back Gap Press, the Victor Adding Machine Company, Chicago, is able to combine high production with extreme versatility. In addition to blanking 30 side frames per minute, the same press is also used for blanking and forming base panels and blanking, forming and piercing keyboard panels at high rates.

This press is part of the Verson line of open back gap presses that includes upright, inclinable and permanently inclined models with normal operating capacities of 90, 125, 150 and 180 tons.

We will be happy to send you further information on efficient, versatile Verson Open Back Gap Presses. Write for descriptive literature.

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There must be some reasonable purpose to everything.

For the supervisor with women workers, it means that he must guard against any seemingly unreasonable conduct, must make orders clear and when convenient explain why and wherefore a little, must make his criticism of the workers understandable and base it upon some recognizable facts and reasons.

On the whole, women not only contribute something worth while in the form of labor, they also have a good influence in the plant. It has been found wholesome for morale to have men and women working together, side by side at similar jobs. Conversation is cleaner. Horseplay is but a minor problem of initial adjustment. Production steps up. Experience has proved that women can do the job. It is to be expected that their contribution will be a permanent one.

the finish  
that starts a  
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Calls...**



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**MORE PIECES PER DRESS!**

- Holds positive form, size and straightness, no shifting of cam.

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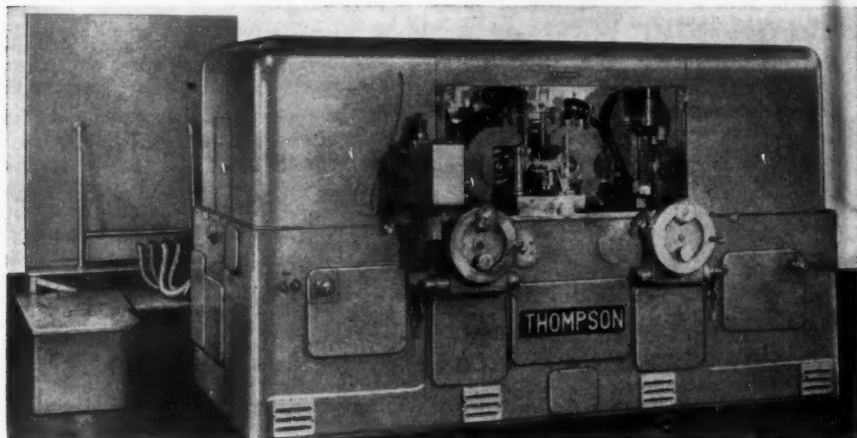
## **Double wheel bucket and blade grinder for jet aircraft**

Root sections on gas turbine buckets made of heat resistant material demand grinding techniques developed to the highest degree in accuracy and productivity as well as economy of operation. Automatic contour grinding with two wheels simultaneously and dressing from a single crusher roll now assures

perfect symmetry in machining turbine buckets. The new Thompson Machine made by Thompson Grinder Co., Springfield, O., features the simultaneous grinding of both sides of the root section from one setting of the work piece fully.

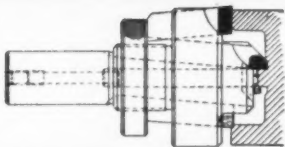
A typical turbine bucket of "Pine

About 30 buckets per hour . . . can be produced with this new double-wheel machine. Production figure takes into consideration down time for dressing, regrinding crusher roll, machine warm-up period, wheel changing, and diamond changing.

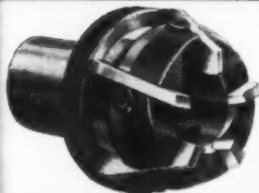


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**ADJUSTABLE HOLLOW MILLS**



STD. 1/4 to 4"  
DIAMETERS  
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PILOTS H.S.S. or  
T.C.T. BLADES

**FACING AND COUNTERBORING TOOLS**

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**GENESEE MFG. CO., INC.**  
ROCHESTER 4, N. Y.

- ADJUSTABLE HOLLOW MILLS
- FACING AND COUNTERBORING TOOLS
- SPECIAL PRODUCTION TOOLS

"Tree" design is approximately 2" long with 150" stock removal per side from the rough to the finish size. Where shape and size variations of the bucket or blade contour are not excessive the part may be held in an adjustable matrix holding block.

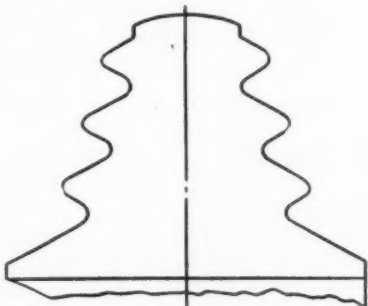
Hood doors of the machine, work clamps, coolant flow and grinding cycle are actuated in automatic sequence from the centralized control panel at the right hand side of the machine.

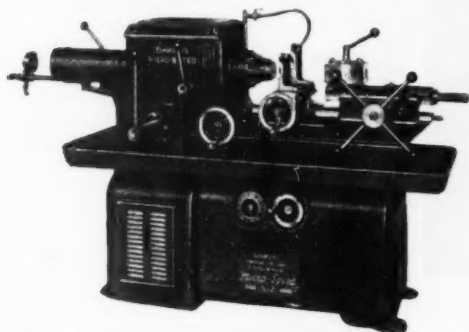
Maximum production rate and low operating cost are the prime objectives of the Thompson Automatic Double Wheel Trueforming Machine. Machines which use the diamond dressing principle with diamond dressers on each wheel are successful from the standpoint of production rate but high wheel and diamond cost results.

To give some idea of the production on the double wheel Trueforming machine the same bucket mentioned above at 150" of stock removal per side can be produced at a "day in" and "day out" rate of 30 buckets per hour. The production rate takes into consideration the down time for dressing, regrinding the crusher roll, initial machine warm-up period, wheel changing and diamond changing. The actual productive time of grinding one bucket is 110 seconds floor to floor.

While the double wheel Trueforming machine is automatic in its operation,

Cross section . . . of turbine blade root section on which both sides are ground simultaneously with a new Thompson machine.





*Plain or Back-Geared* — Forged steel spindle with anti-friction precision bearings, friction clutch and brake. Spindle nose,  $2\frac{3}{8}$ "-8.

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$1\frac{1}{4}$ " bar capacity . . . 14" swing over ways. Micro-Speed Drive offers infinite speeds—plain, 375 to 1500 RPM; back-geared, 44 to 750 RPM—for bar or chucking work. Power feed to turret.

the controls and adjustments are so simple as to allow flexibility in the choice of method of production. To give some idea of the operating sequence we will outline two methods of production using the same bucket as mentioned above as an example. By the first method, making two operations of grinding the bucket down from rough to finish size, the operator loads the work holding block with piece therein into the machine and starts the machine cycle which requires four seconds. The machine will then grind to within .005" of finish size with a total infeed of approximately .145" for each wheel head. The grinding cycle time is 84 seconds. The machine will then come to a stop, open the doors, and the operator will remove the block, which requires two seconds making a total of 90 seconds per block floor to floor. At the second setting of the work piece for the finish grinding, the operator will load as above, which will require four seconds. The machining cycle in this case would be 39 seconds, and the unloading time

would be two seconds, making a total time of 45 seconds floor to floor per bucket for the finishing operation. The advantage of using this method of operation is better control of finish and size. With this first method, which we will refer to as the "rough and finish" method, the operator would crush the wheel every five buckets. The crushing time required is 30 seconds. The crusher roll must be reground after every ten crushings. The time required for regrounding the crusher roll is four minutes, which would mean that the roll would be reground on the first method of operation after every fifty buckets.

On the second method of operation, grinding from rough to finished size in one machine setting, the operator loads the work piece into the machine, requiring four seconds. The machine cycle in this case would be 104 seconds for the removal of approximately .150" total infeed of each head. The unloading time would be two seconds making a total of 110 seconds floor to floor for

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wet cutting  
in 5 to 20  
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the grinding of a rough forging or casting to finished size.

In the second method of operation, it is necessary to crush the wheels after every three buckets, but with the re-grinding of the crusher roll after every ten crushings it would mean that 30 buckets could be ground before it is necessary to regrind the crusher roll. This method of operation has an advantage of faster production which, however, is very slight when the increased frequency of dressing and roll regrinding is considered.

The most important function of grinding the parts is to get absolute symmetrical form on the root section about its axis. The best way to obtain this symmetry is to dress from a common truing device.

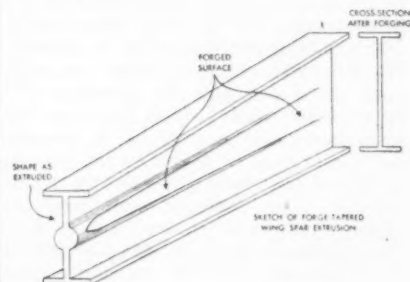
**The end**

### Forge-tapered aluminum wing spars

McDonnell Aircraft Corp. and Aluminum Co. of America last week announced the successful fabrication, on an experimental basis, of forge-tapered aluminum wing spars.

The novelty of the new method of

**Secret of new method . . .** lies in providing a bulb of aluminum in the web of what otherwise is an I-beam extrusion. Length of spar is slightly over 13 feet, final weight is 117 pounds.





*Johnson*

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**AUTOMATIC  
SCREW  
MACHINE**

*Rapid Change-over with Speedier Production*

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**WESTFIELD METAL PRODUCTS CO., INC.**  
WESTFIELD, MASS.

wing spar fabrication lies in providing a bulb of aluminum in the web of what otherwise is an I-beam type extrusion. The extrusion is then forged in such a manner that the bulb of aluminum is progressively flattened. After forging, the web tapers from 10 inches at one end to approximately 15½ inches at the other. The result is a forge-tapered extrusion. Alcoa's Lafayette Works extrudes and the Cleveland Works forges the metal. McDonnell rough machines the forge-tapered extrusion and returns it to Alcoa for heat-treatment and stretching. Then the extrusion goes

back to McDonnell for final machining operations.

The length of the spar is slightly over 13 feet. Its final weight is 117 pounds.

Ordinarily, spars are made by using two extrusions whose cross-sections resemble T's. Small pieces of aluminum plate are riveted to the two extrusions to make a wing spar which tapers. It is readily apparent that many separate operations are required and that a great number of rivet joints must be made.

The new forge-tapered wing spar re-



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of  
every kind  
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means...

**"MORE HOLES  
per grind"**

For a quarter of a century a closely-knit group of engineers and tool design specialists has concentrated its technical knowledge and skill in the production of superb, longer wearing, high precision inserted blade reamers and allied tools.

That's the reason **WAUKESHA** Blades cut with a clean, smooth, positive and effortless shear that saves in horsepower, increases production and, faithfully and regularly, gives you more holes per grind.



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places about 50 parts, thus eliminating many of the riveting operations. Because of the unified structure of the forge-tapered spar there is little possibility of joint fatigue. The use of one solid section, made of high strength Alcoa 75S-T6 aluminum alloy, greatly increases the strength of the spar.

Most important result of the new spar is a 50 pound reduction in weight in the fighter plane for which the spar is being fabricated.

**Replacing worn metal tires**

An improved method of replacing cracked or worn metal tires on kilns, coolers and driers has been developed by Stroh Process Steel Co. of Pittsburgh, Pa. This method of tire replacement, which reduces production losses due to down time, is based on the use of a diagonally cored split tire. By means of inter-locking machined mating surfaces in the rim, this tire can be positioned in the field without tearing out a section of a shell or disturbing the shell's existing alignment. After positioning, the split is welded to make a full, solid ring, which has no machined bolt-held mating surfaces to loosen up under load and heat. The weld metal at the splits does not "hump up" and the tire rolls smoothly over the welded joint.

The only machine work required on the Stroh ring, over and above that of a solid ring, is the planing of the interlocking machined mating surfaces of the rim. This eliminates much expensive machining to close tolerances, necessary on conventional four segment split tires. Easier installation of the diagonally cored design is achieved, since a kiln operator can normally handle a half ring with existing equipment, while in many cases a full ring requires the use of special cranes and outside riggers.

The shell is supported near the damaged tire with a cradle of oak planks, in order to back off the trunnion rollers. The old tire is burned off and the ring halves are positioned with one split at the top of the shell, which is

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UP TO

10 times longer life

With

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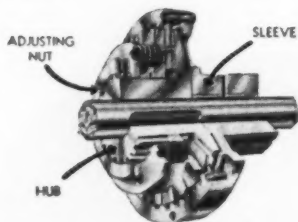
CHICAGO 5, ILL.

centered with spacer blocks. After the tire is bolted to the shell, the top weld is made. In making this weld, the recommended procedure is to preheat the joint and peen the weld metal as it is laid in. The rollers are then repositioned, the load taken off the cradle, and the shell turned to bring the second split to the top. Upon completion of the welding of the second split, bolts are removed and the tire is riveted up. With rollers repositioned and cradle removed, the kiln is ready for operation.

These tires are machined from .35-.45 Carbon fully annealed A.O.H. Steel Castings, A.S.T.M. Specification A 27-46T Grade N<sub>2</sub>. With the carbon on the high side, this material will show about 170 - 180 Brinell on the unworked, machined surface of the face, and will work-harden to about 190 - 200 Brinell. Without excessive sideways flow of the material, a safe loading of about 10,000 lbs. per inch of face can be attained. This value, however, varies with the ratio of the diameters of the tire and roller.

## The NEW Improved series of **HILLIARD** *Slip Clutches*

- PROTECT YOUR MACHINERY FROM DESTRUCTIVE OVER-LOAD
- IMPROVE THE CONTROL OF YOUR REWIND STAND



**REGULAR SERIES**—From 50 inch lbs. to 300,000 inch lbs. torque. Prevents transmission of over-load. Constant torque clutches can be pre-set. **NOW AVAILABLE** — Adjustable while running constant tension clutches. Provide ample friction surface for heavy duty use in reeling and winding operations.

**THE NEW LIGHT SERIES**—high capacity in small size. From 10 inch lbs. to 500 inch lbs. torque. Metallic plates, disk springs. Constant torque—easily adjustable.

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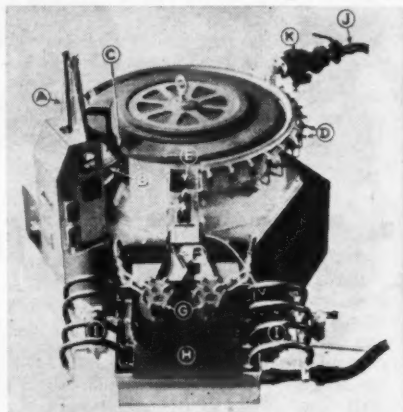
Also manufacturers of over-running and  
Single Revolution Clutches.

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## Hardening, quenching automotive plates

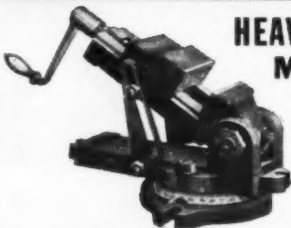
Automotive plates are hardened and quenched at the rate of 800 per hour on



a radiant gas machine designed and produced by Selas Corporation of America, Philadelphia.

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Model**



### For Quick — Accurate Set-ups

**PALMGREN Heavy Duty Angle Vises** are built sturdy and rugged for tough, heavy jobs. They are accurately graduated in degrees, can be quickly adjusted to any angle, stay locked under severe service and save valuable hours otherwise wasted in tedious make-ready, wedging or making temporary jigs and fixtures.

Jaws are hardened and ground. Special outstanding features are the size and opening of jaws—4" jaws open full 4"; the 6" jaws open full 6" etc. with corresponding depth of jaws. Vise can be used as ordinary vise when lowered to horizontal position. Swivel bases furnished if desired. Sizes 4", 6" and 8" jaws and openings. Prompt deliveries.

Write for Bulletin S-5 "All Angle Operations" and complete line of **PALMGREN Vises**  
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THE COMPLETE LINE FOR  
EVERY INDUSTRIAL PURPOSE  
over 5000 shapes, sizes and cuts



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Ground from Solid  
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Inexpensive,  
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HAND CUT  
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Combination  
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FIN FILES

GROBET FILE COMPANY of AMERICA, INC.  
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IN CANADA: 1418 Notre Dame W., Montreal P. Q.

The loading arm places the pieces on the rotary refractory hearth which moves past a series of 24 radiant ceramic gas burners, advancing the pieces at the required temperature-time. At the end of the cycle, the nickel-chrome alloy ejector arm tumbles the pieces into the quench chute, which is baffled to alternate the delivery of heated pieces to two quenching chambers.

The high delivery frequency of heated pieces requires two quenching chambers to obtain the proper quenching time.

Limit switches control the operation of the unloading arm, quench chute baffle, opening and closing of the quench dies, and water injection.

Premixed gas-and-air, in complete combustion proportions, are supplied to the machine at constant pressure by a Selas Combustion Controller. The machine is equipped with a Selas Fire Check.

This kind of automatic radiant gas machine is adaptable to a large number of heating and heat-treating operations.

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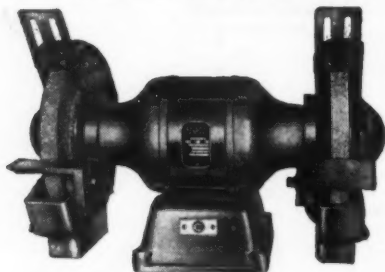
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**Baldor**

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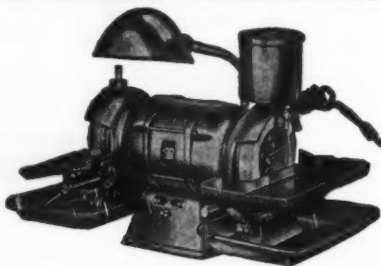
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## PRECISION GRINDERS



Grinder No. 1010 shown here is a rugged 130 lb. general service grinder with 36 & 60 grit wheels. 3 phase, 1725 RPM motor will take plenty of overload and abuse — guaranteed not to burn out. Wide clearance between wheels and motor frame allows working on large or odd-shaped pieces. \$117.00

The Special Reversible Carbide Tool Grinder shown at the right is a heavy-duty, ½ h.p. 3400 RPM grinder for sharpening carbide tools and high speed steel tools. This motor is the trouble-free capacitor-start, capacitor-run type. \$142.60



### OUTSTANDING FEATURES:

The near perfect balance of armatures and wheels on Baldor Grinders provides smooth, vibrationless performance, permitting precision grinding to closest tolerances.

Motors have ample power for normal use plus reserve power to withstand temporary overloads and are built to give years of heavy-duty service.

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## Catalogs, bulletins available from manufacturers ... books, films

1. **Multi-Drive Power Table** for rotary sheet metal work, is portable, compact, equipped with electric foot treadles, and eliminates tool hunting and tool setting. Selection charts are included for rotary machines and rolls. Descriptive 11-page bulletin 85-A available from **Niagara Machine and Tool Works**, Buffalo 11, New York.

2. **Tungsten Carbide Rotary Cutters** are entirely form ground concentric with the shanks to guarantee maximum concentricity and permit their use at high speeds and feeds. Various sizes and shapes available are illustrated in 4-page bulletin 103. **S & E Machine Products Inc.**, Bridgeport, Mich.

3. **No. 36 Rotary Surface Grinder** (Hanchett type) electrically powered, and controlled from a panel of push-buttons, is capable of fast, high-precision work. Features the unique Bijur One-Shot lubrication system. Bulletin 146-3 RM, 7 pages, gives full details and specifications. **Mattison Machine Works**, Rockford, Ill.

4. **Vertical Die and Surface Grinders**, capable of producing finishes of 2 micro inches or better on carbide dies, operate like a vertical profiler finishing surfaces around irregular reliefs with a minimum of wasted motion. Descrip-

tive 4-page bulletin available from **Pratt & Whitney**, W. Hartford 1, Conn.

5. **Hardinge Model HLV Lathe** with a variable speed drive for headstock spindle and an independent variable feed drive for carriage and cross slide, is completely described and illustrated in 5-page bulletin HLV. **Hardinge Bros., Inc.**, Elmira, N. Y.

6. **Rollmaster**, planetary thread rolling machine, quadruples production, saves floor space, cuts man hours and eliminates bottlenecks. 4-page bulletin describing this machine may be secured from **D. H. Prutton Machy. Co.**, 5295 W. 130th St., Cleveland 11, O.

7. **Standard Production Tools**, such as tap holders and drivers; counterbores, countersinks and core drills; and adjustable adapters, are described and illustrated in bulletins Nos. 4-50, 5-50, and 6-50 respectively. Specifications and prices are given. **Scully-Jones Co.**, 1907 So. Rockwell St., Chicago 8, Ill.

8. **"Boosters and Their Practical Application"**, a 4-page editorial reprint, discusses the savings obtained in using single and dual pressure boosters in clamping, pressing, welding, riveting, crimping, shearing, and similar applications. Available free of charge from

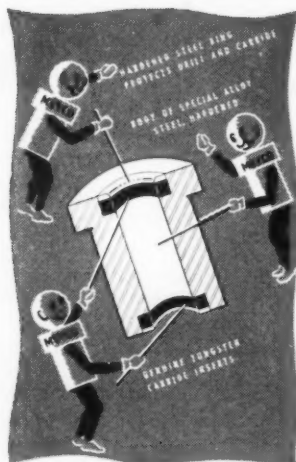


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### MEYCO

**Carbide Inserted Bushings  
Are Doing It Daily!**



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**HOW?** Like this: (1) Last longer ... with a life—in most cases—as long as solid carbide bushings at prices that come close to the prices of ordinary steel bushings; (2) Increased life for your drill jigs and fixtures; (3) Increased life for your drills and reamers; (4) Accuracy maintained for a LONG PERIOD of time; (5) Less non-productive machine time, less lost man hours, because bushings need not be changed as often; (6) Inspection time saved, because of greater accuracy for a longer time; and (7) Less waste due to spoilage, for the same reason. Don't pass up a good bet! Get the dope on MEYCO Carbide Inserted Drill Jig Bushings today!

**Miller Motor Co., 4027-35 N. Kedzie Ave., Chicago 18, Ill.**

**9. Metal Stamping Service** in small lots is explained in 6-page bulletin. Typical examples of savings effected by this process are shown as well as specifications and prices. **Dayton Rogers Mfg. Co., Minneapolis 7, Minn.**

**10. Hi-Power Grinder**, operating at 20,000 rpm, maintains the speed needed for tough grinding jobs. 4-page folder illustrates, outlines the advantages and exclusive features of this tool and

shows its applications. **Chicago Wheel & Mfg. Co., 1101 W. Monroe St., Dept. MT, Chicago 7, Ill.**

**11. Bench - Type End - Finishing Machines** are described and illustrated in 4-page bulletin. Interchangeable features speed deburring work, inside and outside chamfering, facing, center drilling, reaming, boring, etc. **Pines Eng. Co., Inc., 690 Walnut, Aurora, Ill.**

**12. "More Holes in a Hurry"**, a 36-page booklet, gives a complete working knowledge of portable electric drills,

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*Directs Light Exactly Where Needed  
as Easily as Pointing Your Finger*

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Tools, and Work on Assembly  
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Overall length 48 1/4".  
Three instantly adjustable  
joints. Circular  
base for machine, or  
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Single Units \$8.95 ea.

- **Rugged Construction** to stand strains and shocks.
- **Instantly Adjustable** with full swivel ball and socket joints.
- **Infra-red Baked Enamel Finish** — Exterior, Wrinkled Gray — Reflector Interior, high temperature White.
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of Localite models with  
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their care, and how and where to use them. Special emphasis is placed on industrial and agricultural applications of these drills. **Mall Tool Co., 7742 S. Chicago Ave., Chicago 19, Ill.**

**13. Tungsten Carbide Tools catalog** graphically shows the complete line of rotary files, reamers, end mills, boring units, grinding tools, knurls, and small chatterless counter sinks. Line of carbide drills offered for the first time. 20-page catalog available from **The At-rax Co., Dept. C, Newington 11, Conn.**

**14. Fastraverse Metal Working Presses** are illustrated and discussed in 12-page bulletin 5005. Complete descriptions of H-P-M press operation for deep-drawing, forging die straightening, coining, shell-nosing, etc. are included as well as in-action photographs. **The Hydraulic Press Mfg. Co., Mt. Gilead, O.**

**15. Stainless Tube Bending Slide Chart** presents data on desirable minimum radii for economical bending of stainless tubing and pipe. Stainless pipe schedules 5, 10 and 40 are described

# WORLD'S STANDARD of Angle Measurement

H. D. BLOCKS and FIXTURES

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CARBLOX CARBIDE

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Degrees, minutes and seconds in any combination are at your fingertips with a positiveness and speed that has never before been equaled.

The accuracy of the laboratory has actually been brought into the shop. Information on this newest Webber contribution to precision is yours on request.

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and recommended coil diameters for stainless pipe from  $\frac{1}{8}$ " to 4" are included. The Carpenter Steel Co., Reading, Pa.

**16. Borolon**, aluminum oxide abrasive grain for polishing operations, is triple tested for grain size, capillary rise and grain shape. 4-page bulletin ESA-198 contains abrasive grain size recommendations for typical polishing operations and polishing wheel set-up data. Simonds Abrasive Co., Tacony and Fraley Sts., Philadelphia 37, Pa.

**17. Inclinable Power Press, No. 650 Model B**, features three point leg suspension for easy and safe inclining, solid bronze main bearings, larger bed area, higher die space and greater depth of throat. Specifications also included in 4-page bulletin. Perkins Machine Co., Warren, Mass.

**18. Precision Boring Heads and Boring Bars** solve boring problems with speed, accuracy and rigidity due to deep or shallow boring, direct reading, replaceable shanks, etc. Specifications and

**HERE'S HOW NELCO CARBIDE  
CUTTERS HAVE SAVED TIME,  
MONEY - AND IMPROVED  
PRODUCT QUALITY FOR US!**



**THE TRUMBULL ELECTRIC HAS  
INCREASED PRODUCTION OF THESE  
COPPER CONTACTS FROM 200 OR LESS  
TO OVER 12,000 PER GRIND - - -**

Here are the facts:—Four men now produce more contacts than seven men produced originally. More contacts are slotted with one shift than with three shifts previously. Considerable assembly time is saved because of increased slotting accuracy. Rejects are virtually non-existent—an important item, especially when milling hard-to-get copper. Find out how NELCO Carbide Tipped Tools can speed production and save dollars for you. Don't delay, contact a NELCO Distributor Today!

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**HIGH SPEED STEEL CUTTER** — from 30 to 200 pieces per grind.

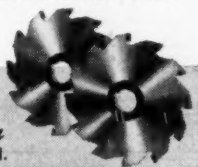
**NELCO CARBIDE CUTTER** — from 6,000 to 13,000 pieces per grind.

A normal increase from 300 slotted contacts per day to over 1,200 per day.

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*For that Extra Edge in Production*  
NELCO TOOL CO. INC. • MANCHESTER, CONN.



prices given in 4-page bulletin. Evered Tool Co., 2000 North Parkside Ave., Chicago 39, Ill.

19. Geneva Dial Indicator with reading of .0001" uses a lever arm instead of a multiplicity of gears to achieve accurate readings at lower cost. Folder with complete data available from Chicago Dial Indicator Co., 180 N. Wacker Dr., Chicago 6, Ill.

20. Super Speed Air Motor, double-acting air cylinder, developing tre-

mendous piston rod speed and power from normal operating air pressure, is suited for staking, riveting, forming, swedging, stamping and punching operations. Specification sheet available from The Bellows Co., 222 W. Market St., Akron 9, O.

21. Bushing Standardization Program replaces more than 1000 different types of transformer and circuit breaker bushings with 38 standard bushings of maximum usefulness, thus cutting in-

ready for *immediate* conversion . . .

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### D 1-S HOLE GRINDER

Immediate low-cost conversion from jig borer into *precision jig grinder* is now possible through the use of the Onsrud D 1-S Hole Grinder. Here's the tool you can't afford to pass up . . . *precision made, for precision work.*

Mounts on jig borer, lathe, mill or radial drill. Grinding wheel turned by Onsrud 50,000 R.P.M. 1/4 H.P. air turbine motor.

More and more shop owners are finding out that the Onsrud HOLE GRINDER is a money-saver in tool making and similar work.

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For cool, lightweight, vibration-free operation . . . for power, speed, economy, it's Onsrud AIR TURBINE GRINDERS every time—say operators who know grinding best! Air Turbine Motors also built for use on machines you build.

Onsrud B-1 Grinder  
75,000 RPM . . .  
1/6 HP for 1/4" wheels and smaller.

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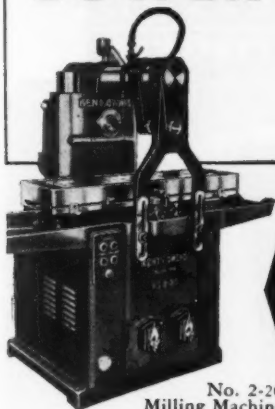
ventory and replacement costs. Informative 12-page bulletin GEC-715 available from **General Electric Apparatus Dept., Schenectady 5, N. Y.**

**22. Electronic Vertical Miller**, a heavy-duty milling and die sinking machine equipped with electronic feed drive for table, cross slide and vertical slide (spindle head), is illustrated and described in a 6-page bulletin published by **Reed-Prentice Corp., Worcester, Mass.**

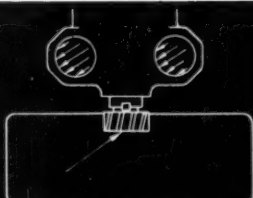
**23. Magni-Focuser** equipped with binocular loop shows objects greatly magnified with depth and clarity of normal vision. See better with less eye-strain and assures greater accuracy in close inspection work. 4-page folder available from **Edroy Products Co., 480 Lexington Ave., Dept. 14, New York 17, N. Y.**

**24. Aircraft Steels Booklet** lists essential features of the new Military Aeronautical Specifications and includes a

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No. 2-20  
Milling Machine  
Table, 42" x 12"  
Table travel, 20"



**TWIN POST MOUNTING.** Head mounted on two cylindrical ground steel posts which carry spindle midway between them — extra rigidity — an exclusive Kent-Owens feature!

Kent-Owens builds 'em rugged . . . simple . . . and versatile . . . machines adaptable to countless milling jobs. Designed for rapid, easy set-up and cost-saving operation. Extra rigid head mounting assures balanced load. Greater cutting efficiency with smooth, powerful cutter drive—only two gear contacts, motor to cutter. Write for bulletins on wide range of hydraulic and hand-operated machines. Kent-Owens Machines Co., Toledo, Ohio.

## KENT-OWENS

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digest of many of the Air Force-Navy, Federal and Aeronautical Material Specifications pertaining to steel, plus the nearest corresponding AISI analyses. 68-page booklet available from **Joseph T. Ryerson & Son, Inc., Box 8000-A, Chicago 80, Ill.**

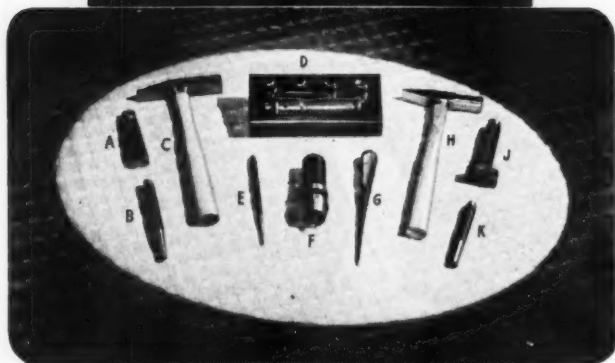
**25. Flexon Bellows and Bellows Assemblies** 17-page catalog covers the selection and application of various sizes and types. Complete specifications and design considerations are also included. **Chicago Metal Hose Corp., Maywood, Ill.**

**26. 101 Polishing Machine**, with centerless feed, requires no chucking, no centering, and no holding, and performs faster and better finishing on metal, fibre, rubber, plastics, and other similar materials. **Production Machine Co., Greenfield, Mass.**

**27. Variable Speed Transmission** features all speeds from top to zero, extreme compactness, rapid reversal without stopping motor, multiplied torque at low speeds, etc. 7-page bulletin 514. **Graham Transmissions, Inc., 3754 N. Holton St., Milwaukee 12, Wis.**



# WHITNEY METAL TOOL COMPANY 41 YEARS EXPERIENCE



## WHITNEY-JENSEN SMALL TOOLS

- A—Rivet Sets. Sizes 00 to 8
- B—Round Handle Punches No. 00.
- C—Square Face Setting Hammers. Sizes 1 to 4
- D—Changeable Hollow Handle Punches
- E—Whitmetal Pin. Length 6-3/4"
- F—One-Piece Hollow Punches No. 4
- G—A-1 Scratch Awl. Length 9"
- H—Beveled Riveting Hammers
- J—Grooving Tools. Sizes 00 to 8
- K—Hand-Forming Rivet Sets

**WHITNEY METAL TOOL COMPANY**  
115 FORBES STREET, ROCKFORD, ILLINOIS

28. Cemented Carbide Tipped and High Speed Centers are discussed in a recent bulletin which includes complete information and specifications for the Morse, Brown & Sharpe, Jarno, Hendey, American Std. Assoc. and Norton tapers. Ready Tool Co., 550-B Iranistan Ave., Bridgeport 5, Conn.

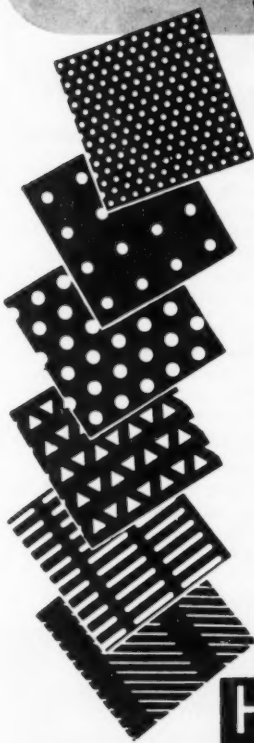
29. U. S. Sanitary Motor feature white baked enamel finish, flush exterior to prevent lodgment of dirt, adjustable mounting positions, sealed terminals, etc. 6-page bulletin 1607 may be se-

cured from U. S. Electrical Motors, Inc., 200 E. Slauson Ave., Los Angeles 54, Calif.

30. Sturdybender Power Press Brakes, built for uninterrupted production, are equipped with removable, adjustable, dovetail slotted bed top, reversible unit flywheel assembly, and one piece frame for minimum deflection, etc. Descriptive 23-page catalog S 1001 is available from The Cyril Bath Co., 6880 Machinery Ave., Cleveland 3, O.

## H & K PERFORATED MATERIALS

offer you . . .



If you do not have  
H & K Catalog #62  
— write for it!

### AVAILABILITY

H & K is prepared to perforate metal, plastic, fabrikoids, masonite, plywood and many other materials available in sheet, plate or coil form—in thicknesses from tissue thin to 1" steel.

### PATTERNS

A wide selection of patterns are available in standard round, square, slot, oblong, triangular holes and also special holes such as indented, lipped, burred, tapered, stabbed, etc.

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Hole sizes can be held to a tolerance of  $\pm .0005$ " when required. Holes are accurate and uniform in size, shape and spacing.

### OPEN AREA

Various spacings and arrangements of our perforations provide wide range from which to select a required percentage of open area.

### SURFACE

Smooth and easy to clean.

Send us your specifications for recommendations without obligation.

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PERFORATING CO.

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114 Liberty Street, New York 6, N. Y.

31. Precision Cylindrical Grinders, 10"-14" type CH main, are illustrated and described in 20-page catalog B-50. Semi-Automatic operation and angular wheel base grinding are also discussed. Landis Tool Co., Waynesboro, Pa.

32. Tool Crib Control speeds tool service, protects tool investment, and gives more production with less tools. Bulletin A-510 presents procedures to prevent theft, hoarding and loss of tools, gages, etc., loaned to employees; cut

crib inventories, etc. McCaskey Industrial Controls, 101 W. 31 St., New York 1, N. Y.

33. Die Castings help produce automatic transmissions. The role of die castings in automatic transmissions is discussed in a 4-page technical folder available from Doehler-Jarvis Corp., 386 4th Ave., New York 16, N. Y.

34. Tool Specialties, such as spring plungers, torque thumb screws, fixture keys, and spring stops, are described and illustrated in a 6-page bulletin.

# Machine de-burring with **NOBUR** pays *BIG* production dividends!

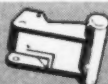


**NOBUR Tools** turn a slow bench operation into fast and efficient machine work! Remove burrs on multi-walled parts with a smooth, clean cutting action that won't mar highly finished surfaces. Eliminate rejects from slow, costly hand work with files, scrapers and abrasives.

**Nobur Tools** are used on any lathe, drill press, portable drill or flexible shaft. Operation of the double-edge cutting blade is easy and safe... no skilled help is required, and the spindle *never* needs to be stopped for either de-burring or chamfering.

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Parts like these  
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**NOBUR MANUFACTURING COMPANY**

717 N. VICTORY BLVD., BURBANK, CALIF.

Applications and advantages are also discussed. Vlier Mfg. Co., 4552 Beverly Blvd., Los Angeles 4, Calif.

**35. Horizontal Duplex Compressors** are direct driven by engine type synchronous motors located between the compressor frames. They are equipped with roller bearings, simplate valves, three-step and five-step control, etc. 25-page bulletin 726-5 sent upon request to Chicago Pneumatic Tool Co., 6 E. 44th St., New York 17, N. Y.

**36. Steel Squaring Shears**, recently im-

proved and enlarged to include models for shearing mild steel plate from  $\frac{3}{16}$ " to  $\frac{1}{4}$ " thick, are illustrated and described in bulletin 901. **Columbia Machinery & Eng. Corp.**, Hamilton, O.

**37. V-Notch Adjustable Micrometers**, fully adjustable, extremely accurate, fast setting and reading, are described in a leaflet available from **The Lester Micrometer Co.**, 3210 Cedar Ave., Cleveland 15, O.

**38. Die Cast Weights** for car or truck, including wheel balance weights, light

delivery truck weights, heavy duty truck weights, and special die cast thin weights are listed and priced on price sheets UB 11-50. Lempeco Products, Inc., 5490 Dunham Rd., Bedford, O.

39. "Business Booms and Depressions" chart includes census significance, employment and unemployment, wage rates, retail sales, and per capita income. This 1951 edition giving the picture of American economy since 1796 is available from U. S. Steel Supply Co., Dept. M.D., 208 S. LaSalle St., Chicago 4, Ill.

40. Somerset Radius Dresser for surface grinders, equipped with new wearover dust proof bearing and clearance angle saves time and makes difficult jobs easy. Dressing operation is easy and accurate. Descriptive 4-page folder is available from Somerset Tool Co., 2200 Virginia St., Hillside, N. J.

## New Technical Books

### Industrial dust control through exhaust systems

By W. O. Vedder. Published by Pangborn Corporation, Hagerstown, Maryland. Third printing 1941. 50 pages, free of charge.

This digest-size book contains a rather complete general treatise on dust control and should be a valuable addition to the files of anyone interested in this subject.

Liberal illustrated with 15 photographs and 10 line drawings, the book treats, in three sections, (1) Exhaust Hoods and Piping Systems, (2) Dust Collecting Equipment, and (3) Exhausters and Drives.

Six basic methods of accomplishing dust control are listed in the introductory chapters. The chapter on Exhaust Hoods and Piping Systems discusses control of air movements, recommended hood and enclosure design and arrangement, exhaust air velocity and volume, and eight rules for installing industrial exhaust system piping.

This book also includes descriptive and application information on various

*Air-O-Chek*

THE VALVE WITH  
THE INTERNAL  
FULCRUM LEVER

**FOR AIR AND LIQUIDS**



Model FA

Model A

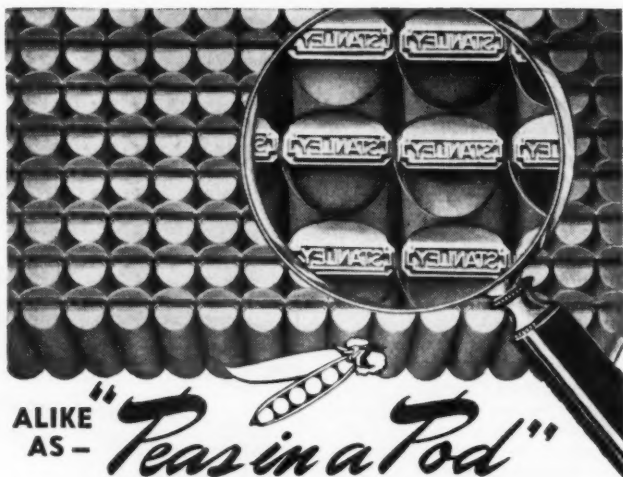
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Ingenious lever arrangement  
makes conventional packing stem  
and gland unnecessary. Saves  
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- For trade marks, identifications, symbols, inspection, patent or part numbers — for marking steel, brass, aluminum, plastic or wood — for marking flat, concave, convex or spherical surfaces. Investigate the FLEXIBILITY of Parker's facilities today!

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types of dust collecting equipment, such as settling chamber, baffle types collector, fan type centrifugal separator, and cloth type filter.

The closing chapter, dealing with exhaust system operation and maintenance, presents methods of testing and evaluating exhaust system effectiveness; and recommendations for locating indicating instruments desirable for making periodic check-ups.

### Power Tools and how to use them

By W. Clyde Lammey, Asst. Editor, Shop Notes and Crafts, Popular Mechanics Magazine. Published by Popular Mechanics Press, Chicago, Ill. 1950. 144 pages, \$2.50.

Information is contained in this book on the use of every popular type of power tool together with safety rules, short cuts and hints for smoother, more efficient operation. The author, a ma-

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12 TON

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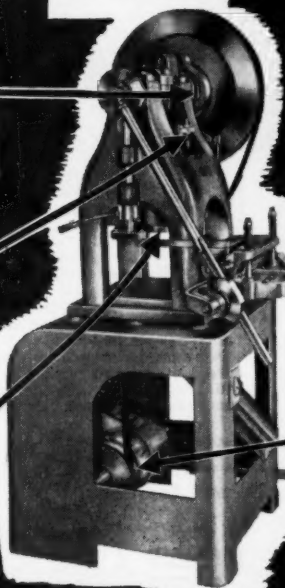
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KNOCKOUT  
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COMPOUND  
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TYPE RAMS,  
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chinent, patternmaker, and later a writer on popular toolcraft subjects, tells and shows the many uses of each tool; explains their operation and tells what projects each tool is best suited for. Hundreds of photographs, diagrams and illustrations simplify the text.

Special sections of the book are devoted to shop planning, woodworking tools, metalworking tools and other light power machines. Complete instructions are given on how to make a variety of fascinating projects especially suitable for construction using power tools.

## Designing with aluminum extrusions

By H. V. Menking, Asst. Director, Technical Service Dept., Reynold Metals Co. Published by Reynolds Metals Co., Louisville, Ky. 1950. 138 pages.

This revised manual explains and illustrates the basic engineering principles for most effective use of extruded aluminum shapes. It breaks down the advantages of the extrusion process into eight principles of design, which



# Chicago "ADJUSTABLE" SHOP SPOT-LIGHT



MODEL 2000-1

## for "On the Spot" lighting

Chicago shop lights are designed to place light at the exact spot desired. Just a touch of the hand performs this operation.

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Each arm is equipped with horizontal and vertical swivels for 100% flexibility.

Shop lights come in a complete range of sizes and can be purchased with various types of mountings.

All models have Underwriters approved cords, plugs and sockets. Each model is finished in grey baked enamel and comes complete with green parabola shade.

The No. 2000-1 shop light is one of our most popular models. This light can be mounted on either horizontal or vertical surfaces. Available in 24", 30", and 44" lengths.

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are explained in detail by diagrams, charts and pictures of actual parts.

One section explains the broad range of shapes that can be produced by the extrusion process; another chapter correlates shape design with manufacturing limits and shows how many of these limitations can be offset by proper design.

Other sections of the book discuss such topics as joint design, dimensional tolerances, fabricating properties, cost factors, choice of alloy and temper, and finishes.

This book is available without charge to engineers, architects, designers, and others requesting it on company letter-head.

## The selection and hardening of tool steels

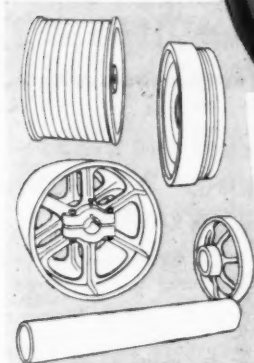
By L. H. Seabright. Published by McGraw-Hill Book Company, New York. \$5.00.

In this manual Mr. Seabright fills the need for a concise classification of steels according to their use and chemical composition, and shows the relation of

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**MADE FROM STOCK  
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the actual properties of one steel to another.

The tool steels are classified into twelve main groups, according to the type of job to be performed and are physical properties desired, and are further broken down into 46 sub-groups or "types" according to chemical composition. A complete listing of chemical analyses of over 950 tool steels is furnished. Each step to be taken in the application of a steel analyses to a specific use is discussed, and numerous

photographic illustrations show examples of these applications and various steps in the heat treating of tool steels.

The author is Research Engineer of the Vulcan Stamping and Manufacturing Company and was formerly Metallurgical Engineer of the Kellogg Switchboard and Supply Company.

### **How to chart timestudy data**

By Phil Carroll. Published by McGraw-Hill Book Company, New York. \$5.00.

The purpose of this book is to help

**Automatic Recessing**  
the "Know-How" of grooving

Wherever grooves, faces, chamfers, etc.,  
are cut — whether internal or external —  
speed production, reduce costs on long runs

with **SJ** SCULLY-JONES

**AUTOMATIC RECESSING TOOLS**

They do these operations on standard drill presses, radial drills, turret lathes and chucking machines, as well as on special machines. A single recessing tool is easily adapted to do various operations or a combination of operations. Adjustments regulating location and depth of groove are simple, fast and accurate. Types "J" and "C" pilot in a fixture bushing. Type "R" pilots in, and stops on the work.

**TYPICAL RECESSING-TOOL OPERATIONS**

Facing An Internal Boss  
On Motor Castings Where  
Obstruction Usually Causes  
Difficulty

Both Inside And Outside Clearance  
Grooves Cut In One Operation  
On Oil Tank Caps For Submarines

Formed Recesses Made In One  
Operation On Decorative Bushings  
Of Large Calibre Motorized Artil-  
lery Rifles

Casting Of Part For Army Tank On  
Which Two Recesses Are Made At  
One Time

Groove For Thread Clearance Cut  
On Auto-Aircraft Projectile With  
Automatic "Necking" Tool

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Pin Hole Of Airplane Pistons

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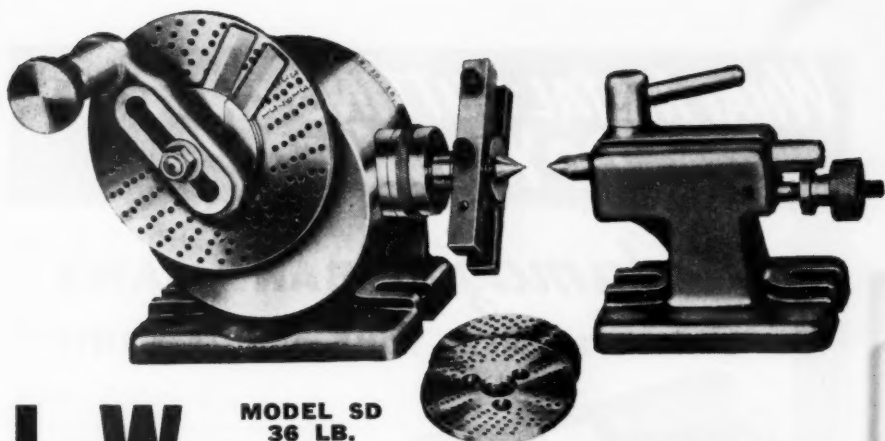
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showing types, sizes, specifications and prices.

solve the problem among industrial engineers, accountants, and timestudy men of how to get the most out of the timestudy dollar. It shows how condensation of mathematical solutions into graphical form provides practical solutions to many timestudy problems. Step-by-step descriptions, and illustrations accompanying each form of construction, indicate proper procedure in setting up timestudy data.

The author stresses methods for reducing the cost per standard, and em-

phasis is placed upon extension of wage incentive application. Information is provided on the standard data method, improving timestudy methods, forms of standard data, standards for curve drawing, timestudy data curves, curves as planning controls, equations in timestudy, etc.

Mr. Carroll, a professional engineer, is well qualified to write this book having had extensive experience in over 140 plants which has made him a top authority on timestudy practices and procedures.



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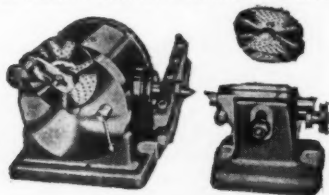
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Model BP 11" Swing for plain milling machines. Shipping weight, 140 lbs.

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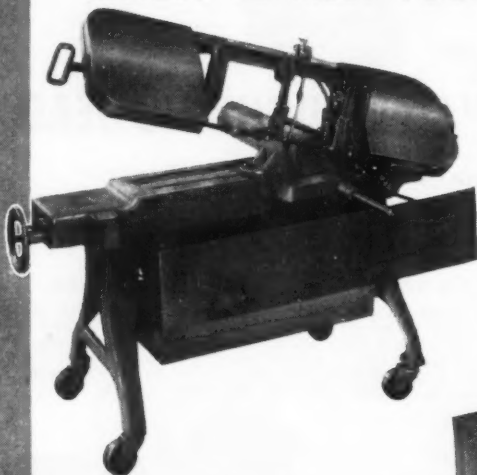
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On the right, Kalamazoo Model 610-S—fast, rugged, and accurate, with a host of exclusive features for finer performance. Takes rounds, tubes, and pipe up to 6" diameter, bars and angles up to 6" x 10". Outstanding low-cost saw on the market. Uses any standard motor  $\frac{1}{3}$  HP, 110/60/1. Same capacity with coolant equipment as Model 610-C. Write today for complete information on any model.



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JUNE, 1951

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NEWS OF THE INDUSTRY • NEWS OF THE INDUSTRY • NE

## **American Supply and Machine Manufacturers to meet in San Francisco**

Arrangements have now been completed for the Joint Convention of the American Supply & Machinery Manufacturers' Association, Inc. which is scheduled to take place in Convention Hall, San Francisco, on June 11, 12 and 13, 1951.

All of the Conference Booths have now been sold, and assignment of the booths has been completed. Nearly 800 rooms have been assigned to the members of three associations; the distributors have assured that the attendance at the convention will be well represented.

A buffet luncheon will be served each day in the Convention Hall to which members of the Association are invited to bring their distributor friends. It has been decided that to leave the Convention Hall for lunch would mean a loss to the manufacturers and distributors of nearly two hours each day, thus the buffet luncheon idea was developed in order to encourage distributors

and manufacturers to remain at the Convention Hall.

Plans have been completed to have taxicabs at all of the hotels on Tuesday, June 12, to bring groups of men to the Convention Hall and back to the hotels after the Conference Booths close.

This Convention and Conference Booth program are being held under somewhat critical conditions, and the convention committee enjoins the complete cooperation of every booth holder and members of the American Supply and Machinery Manufacturers' Association to keep the program moving properly. Members are asked to encourage distributors to attend the convention and conference booths, and to remain in the conference hall — and visit both halls — in order that all booth holders will have the opportunity of seeing as many of their distributor friends as possible.

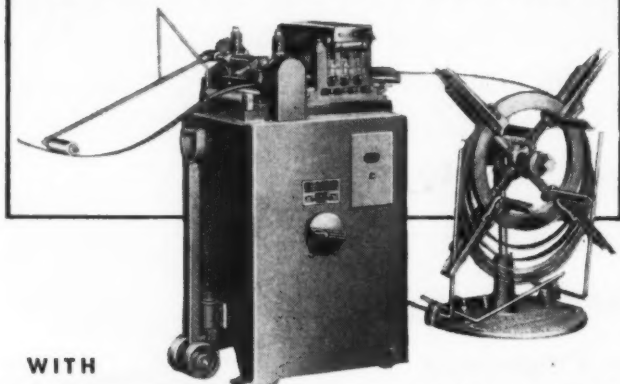
A complete list of the booth holders at the convention follows:

FIRM
Alemite Division-Stewart-Warner Corp.
The Allen Manufacturing Co.
W. D. Allen Manufacturing Co.
American Chain & Cable Co., Inc.
The American Crayon Company
The American Pulley Company

ADDRESS	BOOTH
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Hartford 2, Conn.	1113
Chicago 6, Illinois	801
New York 17, New York	1001
Sandusky, Ohio	311
Philadelphia 29, Pa.	606



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## WITH **LITTELL** Variable Speed STRAIGHTENING MACHINES

Output rises, costs drop when coil stock is fed to the press, the shear, or the slitter through a Littell Straightening Machine. Coil stock comes out of a Littell Straightener flat, with curvature removed. Equipped with variable speed transmissions, Littell Straighteners are easily adjusted to meet a wide range of speed requirements. Thirteen medium and heavy duty models straighten coil stock of all standard widths and thickness.

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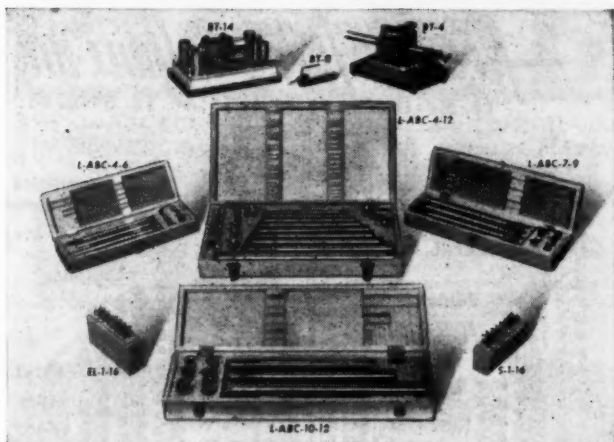
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W. O. Barnes Company, Inc.  
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Bay State Tap & Die Co.

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Cleveland 13, Ohio  
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Chicago 30, Illinois  
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Indianapolis 9, Ind.  
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Detroit, Michigan  
Bridgeport 2, Conn.  
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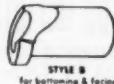
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for general boring



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for bottoming & facing



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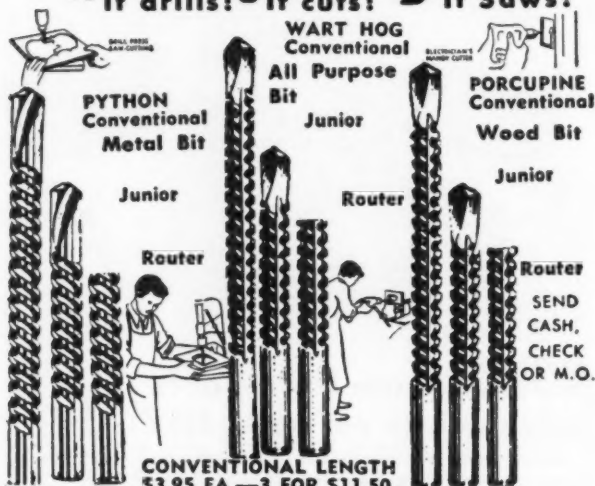
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SAWS, CUTS, REAMS sheet metal, angle iron, pipe, wood, plastic, Transite, etc. Amazing high-speed conglomeration bit and side fits any 1/4" or 1/2" electric drill or slow speed press. Drills own starting hole to quickly cut, saw or ream opening. Easy to operate. Ideal for carpenters, auto mechanics, electricians, plumbers, hobby workers, many others. Abrasive resistant high speed steel. No breaking. Will withstand severe continuous use. Resharpened at no charge. 1/4" diameter. Conventional Drill length 2 1/2", with 2" cutting section. Junior Drill length 2 3/4", with 1" cutting section. Router Bit length 1 3/4" with 1" cutting section. Ground from solid. Shaped some day—money back guarantee. Discounts on quantity orders from dealers.

Each Bit Performs its own Function. Specify which.

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**MILLER ROTARY**  
 HI-SPEED COPE-SAW DRILL-BIT  
 IT SAWS & CUTS & REAMS

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Minneapolis 13, Minn.  
Massillon, Ohio  
Aurora, Illinois  
Brooklyn 6, N.Y.  
New York 18, N.Y.

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The Fafnir Bearing Co.  
The Falk Corporation  
Faultless Caster Corp.  
The Ferry Cap & Set Screw Co.  
Fiske Bros. Refining Co. (Lubriplate Div.)  
Flexible Steel Lacing Co.  
The Franklin Cotton Mill Co.

L. H. Gilmer Company, (Div. U. S. Rubber Co.)  
Globe Woven Belting Co., Inc.  
B. F. Goodrich Co. (Ind. Products Sales Div.)  
Goodyear Tire & Rubber Co., Inc.  
Greene, Tweed & Co.  
Greenfield Tap & Die Corp.  
Greenlee Tool Company

The H. M. Harper Company  
The Harrington Company  
Heller Brothers Co.  
Hewitt Rubber Div. (Hewitt-Robbins, Inc.)  
Hitchcock Publishing Co.  
Hodell Chain Company  
R. Hoe & Company, Inc.  
The Holo-Krome Screw Corp.  
Homestead Valve Manufacturing Co.

The Imperial Brass Manufacturing Co.  
Independent Pneumatic Tool Co.  
Indianapolis Brush & Broom Mfg. Co.  
Industrial Distribution  
Industrial Tape Corp.  
The Irwin Auger Bit Company

Jackson Manufacturing Co.  
The Jacobs Manufacturing Co.  
Jenkins Brothers

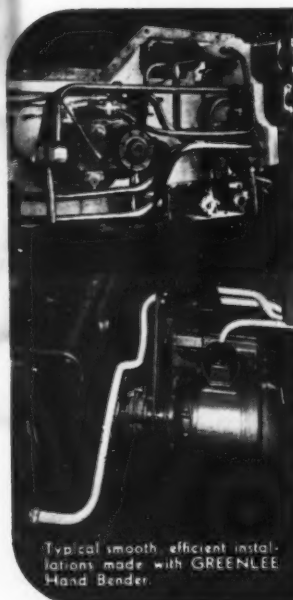
New Britain, Conn. 521  
Milwaukee 8, Wis. 316  
Evansville, Ind. 324  
Cleveland 13, Ohio 513  
Newark 5, N. J. 205  
Chicago 44, Illinois 416  
Cincinnati 10, Ohio 718

Tacony, Philadelphia 35, Pa. 1015  
Buffalo 8, N. Y. 1008  
Akron 18, Ohio 809  
Akron 16, Ohio 522-524  
North Wales, Pa. 411  
Greenfield, Mass. 619  
Rockford, Illinois 904

Morton Grove, Illinois 607  
Philadelphia 30, Pa. 403  
Newark 4, N. J. 610  
Buffalo 5, N. Y. 1102  
Wheaton, Ill. 213  
Cleveland 3, Ohio 716  
New York 54, N. Y. 408  
Elmwood 10, Conn. 1011  
Corapolis, Pa. 301

Chicago 7, Ill. 116  
Aurora, Ill. 210-212  
Indianapolis 17, Ind. 312  
New York 18, N. Y. 819  
New Brunswick, N. J. 119  
Wilmington, Ohio 612

Harrisburg, Pa. 602  
West Hartford 10, Conn. 1103  
New York 17, N. Y. 107-109



Typical smooth efficient installations made with GREENLEE Hand Bender.

## SMOOTH, accurate small-radius bends made quickly in pipe, tubing, conduit with Greenlee Hand Bender

Forming small-radius bends without flattening or kinks is simple, speedy work with a GREENLEE Hand Bender. Ideal in the shop for pipe and tubing installations on machines . . . especially designed to form neat bends for sharp corners, nooks and other close quarters. Various models and sizes for steel, copper, brass and aluminum tubing or pipe, rigid and thin-wall conduit. Write for facts. Greenlee Tool Co., 2006 Herbert Avenue, Rockford, Ill.



Johns-Manville Sales Corp.  
Johnson Bronze Co.

The Kennedy Valve Mfg. Co.  
Keystone Lubricating Co.  
Kraeuter & Company, Inc.

The Lamson & Sessions Co.  
The Thomas Laughlin Company  
A. Leschen & Sons Rope Co.  
Lincoln Engineering Co.  
Link-Belt Company  
The Louis Allis Co.  
Lowell Wrench Co.  
The Lufkin Rule Company  
The Lunkenheimer Co.

Mac-It Parts Co.  
Macklin Company  
Manning, Maxwell & Moore, Inc.  
Marquette Manufacturing Co., Inc.  
Maurey Manufacturing Corp.  
The McGonagal Manufacturing Co.  
Michigan Abrasive Co.  
Mill & Factory  
Millers Falls Company  
Modern Machine Shop (Gardner Pub., Inc.)  
Minnesota Mining & Mfg. Co.  
Morse Twist Drill & Machine Co.

The National Screw & Mfg. Co.  
National Tube Company  
National Twist Drill & Tool Co.  
New York Belting & Packing Co.  
Nicholson File Company  
Norton Company

New York 16, N. Y.  
New Castle, Pa.

Elmira, N. Y.  
Philadelphia 32, Pa.  
Newark 3, N. J.

Cleveland 2, Ohio  
Portland 6, Maine  
St. Louis 12, Mo.  
St. Louis 20, Mo.  
Chicago 1, Ill.  
Milwaukee 7, Wis.  
Worcester 8, Mass.  
Saginaw, Mich.  
Cincinnati 14, Ohio

Lancaster, Pa.  
Jackson, Mich.  
Bridgeport, Conn.  
Minneapolis 14, Minn.  
Chicago 18, Ill.  
E. Rutherford, N. J.  
Detroit 5, Mich.  
New York, N. Y.  
Greenfield, Mass.  
Cincinnati 2, Ohio  
St. Paul 6, Minn.  
New Bedford, Mass.

Cleveland 4, Ohio  
Pittsburgh 30, Pa.  
Rochester, Michigan  
Passaic, N. J.  
Providence 1, Rhode Island  
Worcester 6, Mass.

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620-622  
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218-220  
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1107  
421-423

# *Spectrum* DIAMOND WHEEL-LAP KIT

**\$44.00**  
**COMPLETE**



**The Modern Way to Longer Tool Life . . .  
Extends Life of Cutting Tools Threefold**

This complete kit with accessories is adaptable to all tool grinders for grinding, sharpening after grinding, and lap-finishing form and single point tools—carbide or high speed steel. Assure accurate, sharp, bright, finish-lapped cutting edges for smoother, cooler cutting and longer lasting tools. SPECTRUM LAPPING WHEELS are made of a newly discovered durable material. Wheels can be used with any desired diamond grit size."

- SPECTRUM DIAMOND WHEEL-LAP KIT**  
is ready for immediate use and contains:
- 1—5 gram tube SPECTRUM Pure Diamond Lapping Compound. \*Specify grit size desired.
  - 1—6" cup-type SPECTRUM Lapping Wheel.
  - 1—SPECTRUM Roller for charging wheel.
  - 1—4 oz. bottle SPECTRUM Lapping Oil.
  - 1—SPECTRUM Atomizer Oil Applicator.

**CAN BE SUBSTITUTED FOR DIAMOND WHEELS**

**PENN SCIENTIFIC PRODUCTS CO.**  
5941 ALMA STREET PHILADELPHIA 24, PA.



The Ohio Gear Company  
The Ohio Injector Company  
Oliver Iron & Steel Corp.  
The Oster Manufacturing Co.

Parker-Kalon Corp.  
The Charles Parker Company  
Prestis Vise Div. (Chas. Parker Co.)  
Plomb Tool Company  
H. K. Porter, Inc.  
Porter-Cable Machine Co.  
Putnam Tool Company  
Pyrene Manufacturing Co.

Quaker Rubber Corp.

Raybestos-Manhattan, Inc.  
Reed Manufacturing Co.  
The Ridge Tool Co.  
John A. Roebling's Sons Co.  
David Round & Son  
Russell, Burdall & Ward Bolt & Nut Co.  
Rust-Oleum Corporation

Safety Socket Screw Co.  
A. Schrader's Sons Div. (Scovill Mfg. Co.)  
Shakeproof, Inc.  
Sheldon Machine Co., Inc.  
Simonds Abrasive Co.  
Simonds Saw & Steel Co.  
E K F Industries, Inc.  
Skilsaw, Inc.  
The Skinner Chuck Company  
Smith Welding Equipment Corp.  
The Standard Electrical Tool Co.  
Standard Pressed Steel Co.

Cleveland, Ohio 209  
Wadsworth, Ohio 507  
Pittsburgh 3, Pa. 1014  
Cleveland 3, Ohio 102-104

New York 14, N. Y. 303-305  
Meriden, Conn. 1019  
Meriden 1, Conn. 313  
Los Angeles 54, Calif. 611  
Somerville 43, Mass. 109  
Syracuse 8, N. Y. 123  
Detroit 7, Michigan 114  
Newark 8, N. J. 217-219

Philadelphia 24, Pa. 222

Passaic, N. J. 115  
Erie, Pa. 120  
Elyria, Ohio 111  
Trenton 2, N. J. 201  
Cleveland 5, Ohio 527  
Port Chester, N. Y. 517-519  
Evanston, Ill. 603

Chicago 31, Ill. 616  
Brooklyn 17, N. Y. 604  
Chicago, Ill. 407  
Chicago 41, Ill. 1108  
Philadelphia 37, Pa. 906  
Fitchburg, Mass. 908  
Philadelphia 34, Pa. 106  
Chicago 30, Ill. 308-310  
New Britain, Conn. 322  
Minneapolis 14, Minn. 406  
Cincinnati 4, Ohio 193  
Jenkintown, Pa. 523



## COLMONOY TIPPED

**Colmonoy tipped centers will  
outlast standard centers 7 to 1**

You don't have to scrap your old worn centers any more. You can make them even better than new, by applying Colmonoy tips. A simple silver soldering job gives you a center with a tip seven times more resistant to wear than a new standard center. You can retip the same shank time after time, cutting your center costs to the bone.

Send for new descriptive folder giving prices and expected center life.

**DIAMONDS and TOOLS, inc.**

AFFILIATED WITH WALL COLMONOY CORPORATION

19245 JOHN B ST - DETROIT 3, MICHIGAN

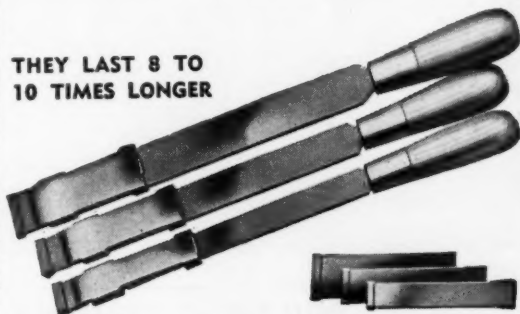
Standard Tool Company	Cleveland, Ohio	706-708
North Bros. Div. (Stanley Tools)	Philadelphia, Pa.	821
Stanley Tools	New Britain, Conn.	823
Stanley Electric Tools	New Britain, Conn.	823
Star Expansion Bolt Co.	New York 6, N. Y.	512
The L. S. Starrett Company	Athol, Mass.	1018
Steel (The Penton Publishing Co.)	Cleveland 13, Ohio	306
Super Tool Company	Detroit 13, Mich.	404
S. G. Taylor Chain Co.	Hammond, Ind.	228
Templeton, Kenly & Co.	Chicago 44, Ill.	813
Thermoid Company	Trenton, N. J.	805
The Henry G. Thompson & Son Co.	New Haven 3, Conn.	1009
Threadwell Tap & Die Co.	Greenfield, Mass.	1101
Trimont Mfg. Co. (Div. Aetna Ind. Corp.)	Roxbury 19, (Boston) Mass.	117
Tube Turns, Inc.	Louisville 2, Ky.	617
Union Manufacturing Co.	New Britain, Conn.	409
Union Twist Drill Co.	Athol, Mass.	509
Union Wire Rope Corp.	Kansas City, Mo.	318
Utica Drop Forge & Tool Corp.	Utica 4, N. Y.	1115
Van Dorn Electric Tool Co.	Towson 4, Md.	319
Victor Saw Works, Inc.	Middletown, N. Y.	112
The Vincent Steel Process Co.	Detroit 7, Mich.	515
Walker-Turner Div. (Kearney & Trecker Corp.)	Plainfield, N. J.	113
Wainworth Company	New York 17, N. Y.	307
Weinberg & McKee, Inc.	Chicago 6, Ill.	732
Whitman & Barnes Div. United Drill & Tool Corp.	Plymouth, Mich.	910
J. H. Williams & Co.	Buffalo 7, N. Y.	1002
Wilton Tool Manufacturing Co.	Chicago 14, Ill.	614
Winter Brothers, Company	Rochester, Mich.	320
J. Wiss & Sons Co.	Newark 7, N. J.	215
Wood Shovel & Tool Co.	Piqua, Ohio	807
Worthington Pump & Machinery Corp.	Harrison, N. J.	502
Yale & Towne Manufacturing Co.	Philadelphia 15, Pa.	125
Yarnall-Waring Company	Philadelphia 18, Pa.	722

## CARBOLOY TIPPED SCRAPER BLADES

Available in  
three widths



THEY LAST 8 TO  
10 TIMES LONGER



Especially good for hard alloy iron and extremely hard bronze castings. If you are using Anderson Hand Scrapers it is not necessary to buy complete new scrapers in order to use carboly tipped blades. Simply remove high-speed blade and slip in the Anderson Carboly Tipped Blade.

Write for Bulletin No. 6-5

**ANDERSON BROS. MFG. CO., Rockford, Ill.**

Balancing Ways, Roto Checkers, Hand and Power Scrapers, Spotters, Hand and Power Hydraulic Straightening Presses.

### ASTE elects new officers

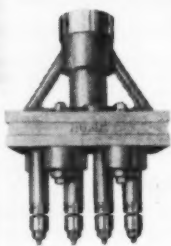
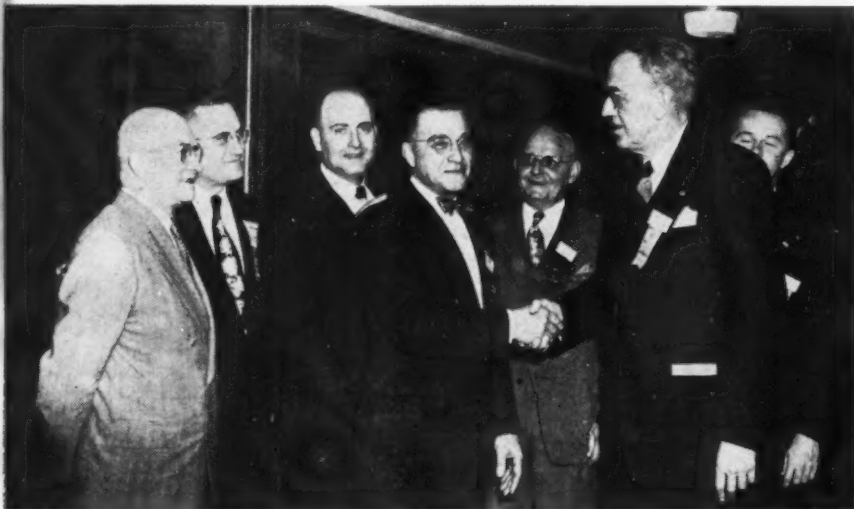
J. J. Demuth, general superintendent and member of the executive committee, Sligo, Inc., St. Louis, has been elected president of the American Society of Tool Engineers at the Nineteenth Annual Meeting of the technical society at the New Yorker Hotel.

L. B. Bellamy, manager, Detroit branch, Sterling Grinding Wheel Co.,

Div. of Cleveland Quarries Co. was named first vice president and Roger F. Waindle, general manager, Industrial Products Div., Elgin National Watch Co., Elgin, Ill., was elected second vice president of the society.

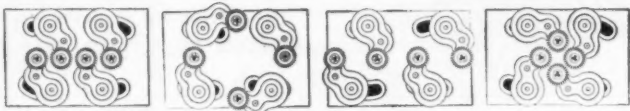
T. J. Donovan, Jr., owner, Donovan Co., Philadelphia, was elected third vice president; W. A. Thomas, superintendent of tool engineering, Ford Motor Co.

**New ASTE officers . . .** installed at the technical society's annual dinner, March 16, are, left to right: W. A. Thomas, ASTE secretary, H.C. McMillen, treasurer; L. B. Bellamy, 1st vice president; J. J. Demuth, president; T. J. Donovan, 3rd vice president; Herbert L. Tigges, vice president; Dr. H. B. Osborn, assistant treasurer-secretary.



### MULTIPLE SPINDLE DRILL HEADS ADJUSTABLE TO STRAIGHT LINE AND RADIAL PATTERNS

FIXED HEADS TO SPECIFICATIONS LITERATURE ON REQUEST  
NOBLE MACHINE TOOL CO. 195 Weeden St., Pawtucket, R.I.



of Canada, was elected secretary; H. C. McMillen, general superintendent, Seeger Refrigerator Co., Evansville, Ind., was named treasurer; and Dr. H. B. Osborn, Jr., technical director, TOCCO Div., Ohio Crankshaft Co., Cleveland, was chosen assistant secretary-treasure was chosen assistant secretary-treasurer.

Elected to the board of directors of the society, in addition to Demuth, Bellamy, Donovan and retiring president, H. L. Tigges, were: H. E. Collins, chief tool engineer, Hughes Tool Co., Houston, Texas; Jos. P. Crosby, vice president, LaPointe Machine Tool Co., Hudson, Mass.; E. W. Ernst, superintendent, General Electric Co., Schenectady, N. Y.; G. A. Goodwin, chief process engineer, Master Electric Co., Dayton, O.; Ben J. Hazewinkel, L. S. Starrett Company, Denver, Colo.; and W. B. McClellan, engineer, Gairing Tool Co., Detroit.

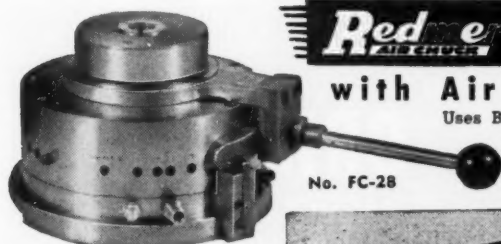
Alfred Eckerle, Detroit, Mich., has been made vice president in charge of operations of Conant Tool and Engi-

neering Co., Chicago Ill., manufacturers of broaching tools and fixtures. **James J. Webb**, Detroit, Mich., has been named vice president in charge of engineering and sales.

**L. E. Loshbough** has been elevated to the presidency of the Federal Press Co., Elkhart, Ind., according to an announcement received from the company today. Mr. Loshbough succeeds his father J. E. Loshbough, founder of the business.

**Norman W. Calkins** has been named manager of tool steel sales and Harold A. Brossman, manager of alloy steel sales by The Carpenter Steel Co., Reading, Pa.

**Theodore E. Spilker**, secretary, was made a vice president and secretary of Nice Ball Bearing Co., Philadelphia, Pa. **John E. Mullen**, formerly plant manager, was also made a vice president, and **Henry M. McAdoo** assistant to Mr. Mullen, was advanced to the position of plant manager.



RC-5



**Air Foot Control  
and Valve**



Uses Brown & Sharpe type collets. Capacity 1/16" to 3 1/2".  
Write for literature and prices

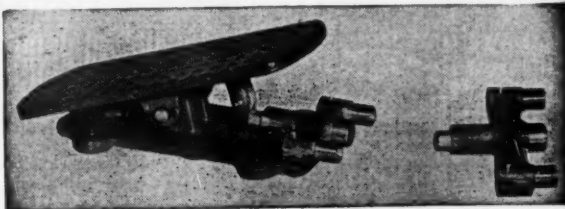
**REDMER AIR DEVICE CORPORATION**  
BOX 247 GUNTERSVILLE, ALABAMA

## **Redmer INDEX CHUCK** with Air Operated Collet

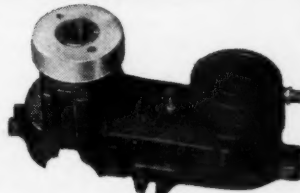
Uses Brown & Sharpe type collets. Capacity:  
1/16" to 2".

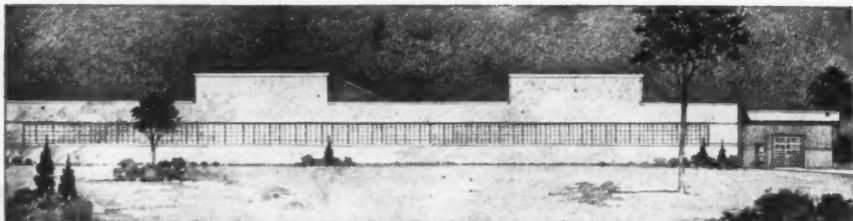
No. FC-28

V-29



## **COLLET AIR CHUCK**





**New plant . . .** of the Hannifin Corp. The plant will be located at Des Plaines, Ill., a suburb of Chicago, and is expected to employ 150 people.

#### **New plant for Hannifin**

Construction of a new parts plant now being erected on a 17-acre site in Des Plaines, Ill., a suburb of Chicago, is announced by Ellwood G. Peterson, president of Hannifin Corp. of Chicago. The modern, one-story factory building is the first of a series of buildings planned by Hannifin for this location. This initial unit will cost over \$350,000 and contain approximately 40,000 square feet.

Hannifin Corp., manufacturers of pneumatic and hydraulic machinery and equipment, have plants in Chicago and St. Mary's, O. This first unit is expected to employ 150 people.

**Jonathan N. Rawson** has been appointed as director of industrial activities for the Brown & Sharpe Mfg. Co. In this position Mr. Rawson will direct the health, safety, welfare and recreational activities of employees.

*Acme Offers Complete Facilities for All Types of*

## **PRECISION GRINDING**

**FAST SERVICE...EXPERT WORKMANSHIP...LOW COST**

- INTERNAL
- EXTERNAL
- CRUSH FORM
- CENTERLESS
- TWIN DISC
- SURFACE
- THREAD



Acme is equipped to handle all types of precision grinding. Expert craftsmen, using newest methods and modern equipment, will do the job for you faster, better, more economically. Acme also offers a flat lapping service that can finish surfaces to within millionths. Write for details.

### **Acme Industrial Company**

*Makers of Standardized Jig & Fixture Bushings*  
**210 N. LAFLIN ST., CHICAGO 7, ILL.**

**THE SERVICE SHOP TO INDUSTRY FOR MORE THAN 25 YEARS**



H. A. Gay



C. M. Beach

Hayward A. Gay has been appointed vice president for The Cincinnati Milling Machine Co., Cincinnati, O. Other appointments include: Carl M. Beach, domestic sales manager; Carl F. Stugard, manager Chicago office, Cincinnati Milling and Grinding Machines, Inc., sales subsidiary of The Cincinnati Milling Machine Co.



C. F. Stugard



D. M. Laflin

Donald M. Laflin has been appointed head of the Giddings & Lewis Sales Organization as general sales manager, Ralph J. Kraut, president, announced.

William C. Miller has been appointed Plant Manager of Plant 4 of Richard Brothers Div., Allied Products Corp., Hillsdale, Mich. Mr. Miller will be directly responsible to Mr. Walter Jakubowski, vice president in charge of all of Allied's commercial die work.

Robert G. Faverty, managing director of Armstrong Whitworth and Co., Pneumatic Tools, Ltd., Thor subsidiary in Newcastle-On-Tyne, England, was elected vice-president of Independent Pneumatic Tool Co. at the annual meeting of the board of directors held March 14, it was announced this week by Neil C. Hurly, Jr., president.

bend pipe by hand or  
power with

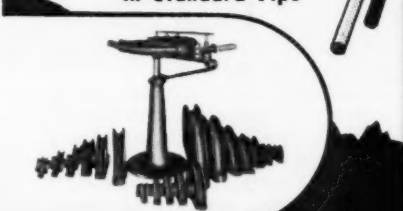
**American**

Cold Pipe, Conduit and  
Heavy Wall Tube

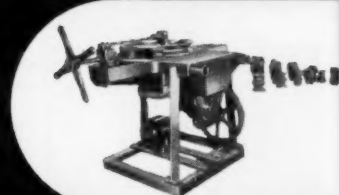
**BENDING MACHINES**

Fast...Simple...Dependable

**RADIANT HEAT BENDS**  
in Standard Pipe



Hand-Powered "American" A-30  
Fast...Accurate...Average  
bend takes only 10 seconds! Up  
to 180° bends...all sizes from  
1/2" to 2". Usual radiant heat  
bends for 1 1/4" at 6" and 9" radii  
can be supplied. Only 7 parts.  
Standard radius 5 times pipe size.  
Occupies 18" x 18" floor space.



Motor-Powered "American" 2PB  
Capacity 1/2" to 2" standard pipe  
...Standard radius 5 times pipe  
diameter, up to 180°...Maximum  
radius 13". Complete with rolls  
for each size pipe. Standard motor  
equipment 2 h.p.

Special radii  
supplied on  
request

**American**  
PIPE BENDING MACHINE  
Company

Factory and Main Offices:  
9 Furnace St., Poultney, Vt.



## Hanna Celebrates 50 years

Hanna Engineering Works, Chicago manufacturer of hydraulic and pneumatic cylinders, valves and riveters, is celebrating its fiftieth anniversary this year.

The company was founded in 1901 by Elmer Ellsworth Hanna, although Mr. Hanna had begun manufacturing operations a few years earlier in a small rented space. Incorporation of Hanna Engineering Works followed in 1903.

Principal products of Hanna in the early years were hydraulic yoke riveters and foundry sand sifters, but the list of products manufactured over the half century includes: automobile cylinder blocks, concrete block machinery, diamond drilling machinery, bottle washing machinery, foundry molding machines, metal sawing machines, railroad turntable machinery, pulverizing machinery, grease compressors, tire-

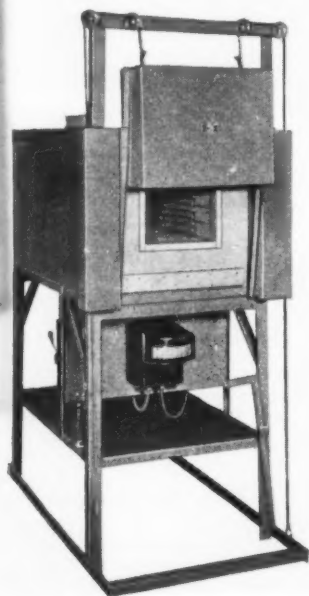
making machinery, tire presses and bridge operating machinery.

Air cylinders and valves were first made by Hanna in 1914 following purchase of a company manufacturing these products. Hydraulic cylinders were designed and developed originally by Hanna and are considered among the finest in the field.

Today, Hanna cylinders and valves are used in thousands of industrial plants throughout the world to simplify the actuation and control of all types of machines and equipment.

Appointment of John Obrebski as metallurgist of The Monarch Machine Tool Company, was announced today by Kermit T. Kuck, Engineering vice President.

Ermand L. Watelet was recently appointed director of design of precision tools and gages by the Brown & Sharpe Mfg. Co. of Providence, R.I.



## "MULTI-INSULATION"

*is the secret of . . .*

## HUPPERT

## FLOOR MODEL FURNACE

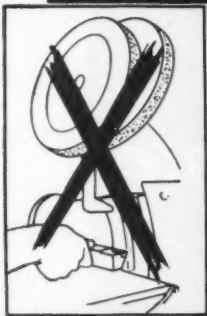
The sturdy, production-type Huppert Furnace not only attains highest-level efficiency, but cuts operating costs to a minimum through unique Huppert method of multi-insulation surrounding all sides of the work chamber. This furnace provides a versatile heat range—continuous up to 1850° F., intermittent to 1950° F. Also built for 2300° F. for special applications.

*This model built in 20 different sizes, Model No. 16 illustrated, 12" x 8" x 18"*  
**\$925.00**  
complete

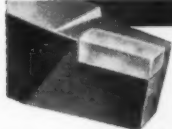
Automatic temperature control featured. Also tight-sealing, wedge-type door and convenient shelf, 220 V. AC, single or 3-phase operation (110 V. or 440 V. models to order).

## K. H. HUPPERT COMPANY

6845 Cottage Grove Avenue Chicago 37, Illinois  
Manufacturers of Electric Furnaces & Ovens



# How to CONSERVE Grinding Wheels and Operator Time



Conservation of materials and manpower, always essential, becomes imperative in times of emergency.

Marked savings in equipment and labor required for maintenance operations are readily effected by using metal-cutting tools that stay sharp longer. The full significance of this fact is perhaps not fully realized.

Kennametal tools, for example, work more hours per day, spend less time in the grinding room, and thus help sustain machine productivity, make operators more efficient, and reduce inventory. On important jobs they have demonstrated an ability to do up to four times as much machining per unit of carbide consumed.


This superior performance results from a unique coordination of manufacture and an all-inclusive control of properties—from raw materials to finished product.

Kennametal Inc., in its own plant, refines all carbides directly from ores, oxides, and by-products; processes these

carbides into Kennametal compositions by means of exclusive methods and patented techniques; and fabricates complete tool and wear-part designs that utilize the distinctively uniform combination of hardness, strength, and wearability inherent in Kennametal. Outstanding among these efficient application developments is the mechanically-held technique, in which we pioneered.

A sure means to prevent waste of man-hours and equipment, therefore, is Kennametal tooling.

For those who wish assistance in developing tool applications that provide maximum cost-saving and productivity through utilizing the unique properties inherent in Kennametal, the Company maintains a corps of competent Field Engineers in all important industrial centers. Their services are available to you for the asking.

 **KENNAMETAL Inc.**  
Latrobe, Pa.  
MANUFACTURERS OF SUPERIOR CEMENTED CARBIDES  
AND CUTTING TOOLS THAT INCREASE PRODUCTIVITY



CLAMPED-ON  
STYLE BLH



STYLE VG



UNIVERSAL  
FACE KENNAMILL



KINDEX  
STYLE 12SKD



KENNAMATIC  
STYLE RAL



SERRATED MILLING  
CUTTER BLADES

# A *better* Lathe from any *angle*.



By whatever standards you measure a lathe—bearings<sup>1</sup>, capacity<sup>2</sup>, gearing<sup>3</sup>, apron<sup>4</sup>, bed<sup>5</sup>, power to spindle<sup>6</sup>, accuracy<sup>7</sup>—whatever is important to *you*, you will find it completely satisfied in a SHELDON lathe.

(1) "Zero Precision" Tapered Roller Bearings—the best Timken collet lathe. (2) Large Choice of capacity with (3) Hobcut gears throughout for smooth operation. (4) Modern full double wall apron. (5) Bed has an engineered backbone. (6) Two V-belts to spindle for greater pulling power. (7) Holds precise accuracy for years.



## SHELDON

### CHICAGO

SHELDON MACHINE CO., Inc., 4242 North Knox Ave., Chicago 41, Ill.

JUNE, 1951

MTBB

WHAT'S NEW • WHAT'S NEW • WHAT'S NEW • WHAT'S

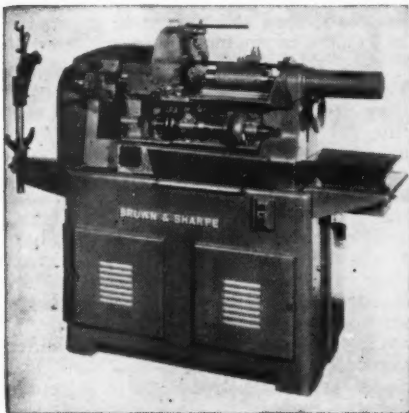
## **Brown & Sharpe opposed spindle type automatic cutting-off machine**

THE NEW opposed spindle type Automatic Cutting-Off Machine has recently been introduced by Brown & Sharpe Mfg. Co., Providence 1, R.I. This unit is provided with 16 spindle speeds, with a spindle range of from 454 to 5000 r.p.m. The drive is by a 2 h.p. constant-speed motor, mounted on an adjustable bracket on the base of the machine under the tank table. The drive to the

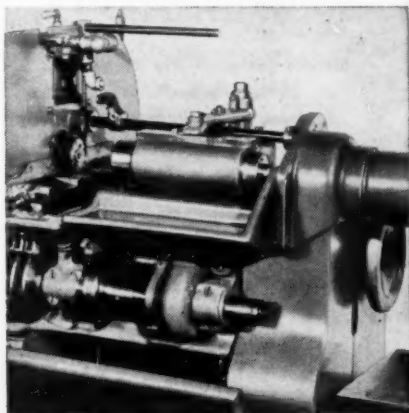
work and opposed spindles is through a v-belt to the shaft in base, then through change gears and flat belts to the spindles.

The work spindle is mounted on precision anti-friction bearings at the front and rear, running in boxes which are supported in the bed of the machine. Bearing surfaces of the spindle are hardened, ground and lapped. End

**Brown & Sharpe Automatic Cutting-Off Machine . . .** showing front view of the opposed spindle type unit. Machine has speed range of 454 to 5000 r.p.m.



**Front view of the opposed spindle . . .** of the machine; the device is driven in the same direction and at the same speed as the work spindle.



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thrust is taken by preloaded precision ball bearings included in the rear spindle bearing assembly. The spindle, spindle bearings and pulley constitute a unit assembly, readily removed from the machine. The diameter of the hole through the spindle is 11/16".

The opposed spindle is driven in the same direction and at the same speed as the work spindle. It is mounted on precision anti-friction bearings supported in a bracket on the machine bed. The spindle is advanced and withdrawn from gripping position by a cam easily formed and quickly applied to the shaft at the right end of the machine.

Stock is gripped in the spindle by a spring collet at the extreme front of the spindle. The collet is opened and closed automatically by the longitudinal movement of the spindle.

The stock is advanced by the spring feeding finger at the end of the feed tube in the spindle, directly behind the collet. The outer end of the feed tube has ball bearing, carried in bracket which is cast integral with cam-operated feed slide. A spring safety device prevents breakage in case of interference with advance of feed tube. The collet is operated and stock advanced automatically as it is controlled by a trip dog at the front of the machine; the operating cycle is completed in 1/4 second. One operating cycle feeds any length up to 1"; greater lengths up to 4 1/2" are fed by successive cycles. A scale on the feed slide bracket shows length of feed selected; it is graduated in 1/16ths of an inch or in millimeters.

Two independent cross slides are standard equipment, front and rear; they are mounted in scraped ways cast integral with the machine bed. Ways are guarded from chips and automatically oiled. The feed of each cross slide is controlled by an individual cam made from steel disc, easily formed and quickly applied to the camshaft at the front of the machine. Each cross slide has transverse adjustment, with a dial graduated to .001"; it also has a screw-type positive stop. Provision is made for operating the cross slides manually while setting-up. Two tool posts are furnished taking circular forming tools.

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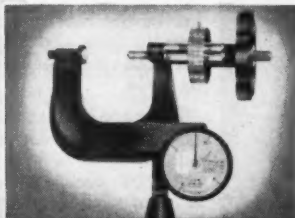
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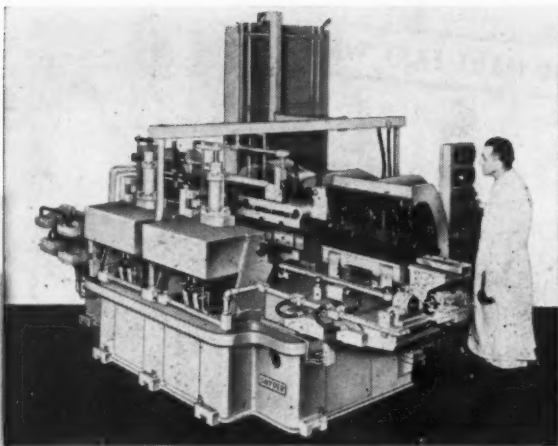
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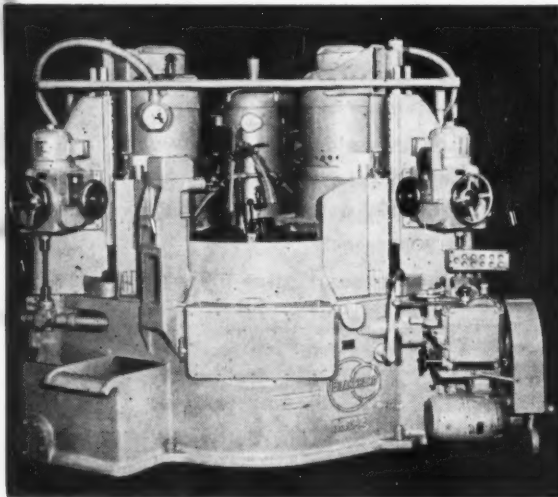
**AMES PRECISION MACHINE WORKS  
WALTHAM 54, MASS.**





**Snyder 5-station transfer machine . . . .** accomplishes complete operation in 36 seconds with h.s.s. tools

**Blanchard Surface Grinder . . .** equipped with vertical spindle and rotary table; this new unit can be fitted with a 40" round magnetic chuck or plain table. Three abrasive wheels provided. One spindle can be set to grind a surface at the same or different height. Illustrated model provided with 2 spindles.



## **Snyder 5-station transfer machine**

A special-purpose, five-station, line transfer machine which drills the main bearing cap holes and drills, reams and chamfers the master dowel holes in cast iron, valve-in-head cylinder blocks, has been introduced by Snyder Tool & Engineering Co., 3400 E. Lafayette Ave., Detroit 7, Mich.

The operation is automatic after loading and automatic hydraulic clamping is provided at each station. The entire operation requires only 36 seconds, giving a production ratio of 80 pieces an hour at 80% efficiency. The machine can be operated by unskilled labor.

Progress through the stations is as follows: No. 1, load and turn the part through 90° bringing the bottom face to the right. No. 2, drill 10 holes of various sizes. No. 3, ream and chamfer two holes. No. 4, turn the part 90° bringing the bottom face down. No. 5, transfer block to conveyor.

Hydraulically operated, counterweighted brackets turn the part 90° at the loading and unloading station so that it enters and leaves the machine on the bottom face and transfers through the machine on its side.

Tools are high speed steel revolving at 80 s.f.p.m. with feed of .099 for drilling and 55 s.f.p.m. with feed of .015 for reaming. Unit stroke is 14.25". Two standard Snyder guide bar units are used.

Drive is by motors through coupling to spur gears using one 7½ h.p. motor for the drilling operation, one 2 h.p. motor for the reaming operation, and one 10 h.p. motor for the hydraulic unit. Indexing mechanism is hydraulic transfer type. Base and column construction is heavy, welded steel plate, thoroughly normalized and braced for rigidity. Necessary floor space is 110"x162".

#### Rotary table surface grinder

The Blanchard Machine Co., 64 State St., Cambridge, Mass., announces the development of the No. 16A3 vertical spindle Rotary Table Surface Grinder. This unit can be equipped with a magnetic chuck 40" in diameter, or a plain table, to accommodate a fixture to hold non-magnetic work or pieces of irregular shape. The maximum swing of work or fixture is 49".

This grinder is equipped with three abrasive wheels; all three can be set to grind the same surfaces, when stock removal is heavy, or when accurate tolerances for dimension or surface finish are required. All grinding wheels are under the control of the Blanchard automatic caliper, or sizing device, which will, in ordinary practice, hold dimension variation within a total range of .001".

One spindle, if desired, can be set to grind a surface at the same or different height, at a different distance from center of chuck.

The illustration shows such a grinder, which in this case is equipped with two spindles driven by 30 h.p. motors and one driven by a 15 h.p. motor. This grinder is equipped with a Blanchard 24-station fixture, arranged for automatic clamping and releasing, for grinding connecting rods with the wrist pin boss at an offset height.

#### Burgmaster 6-spindle automatic indexing machine

Combining the time-saving features of the turret lathe and the simplicity and adaptability of the drill press is this new model 6-spindle automatic indexing drilling and tapping machine, introduced by the Burg Tool Manufacturing Co., Dept. BB-7, Durango Ave., Los Angeles 34, Calif.

The No. 2 Model A Burgmaster is



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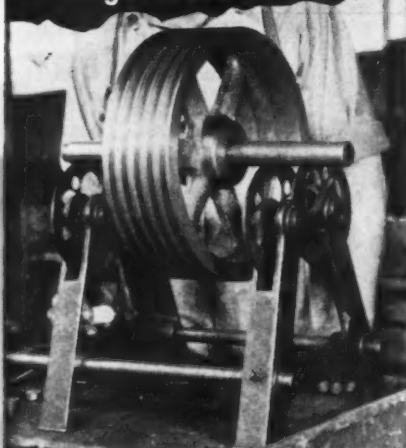


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Checking balance of lathe spindle.

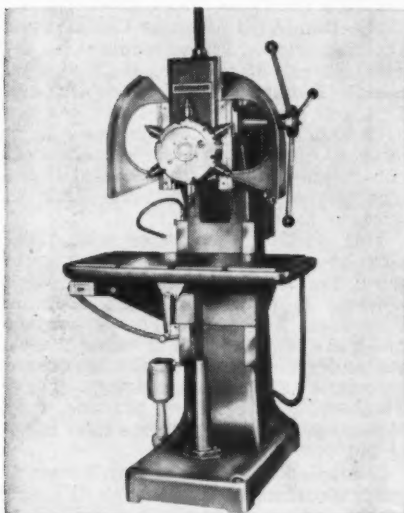
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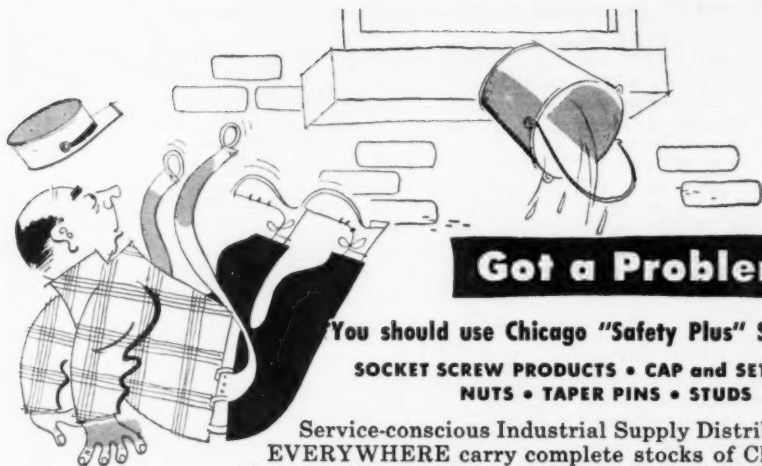
**SUNDSTRAND MACHINE TOOL CO.**  
2535 Eleventh Street, Rockford, Ill., U.S.A.

claimed to cut costs by eliminating waste motion in production; to do away with the movement of a work piece from one machine to another. The set-up is simple and fast; one unit does the work of five or six machines, cutting down on the amount of power used and floor space needed, as well as man hours. The power and accuracy of the new machine permit the use of high cutting speeds.



The power index from one spindle to another has a wide range of spindle speeds, pre-selective for each spindle, and automatically indexed, capable of holding close tolerances on depth. The machine is equipped with a heavy duty tapping head with an 8" stroke. The table work surface is 17"x33". Throat depth is 11 1/4". The spindles operate on tapered, adjustable roller bearings. The totally enclosed gear box runs in oil.

The new No. 2 Model A Burgmaster makes the use of carbide tools for second operations on drill press work practical, since in many cases, several operations on one part can be completed without moving the part, thus eliminating the danger of tool breakage due to the jig being out of position in respect to the tool.



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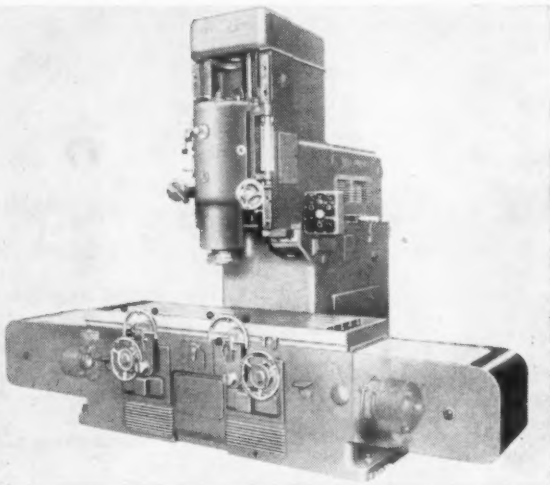
LOS ANGELES 38, CALIFORNIA

### Reed-Prentice improved vertical milling machine

Improvements in its No. 4 "Electronic" Vertical Milling machine have been made by Reed-Prentice Corp., Worcester 4, Mass. The unit is now being offered in both 48" and 60" capacities; the new 60" model offers a working surface of 24x96" while the 48" model provides a 24x84" working surface.

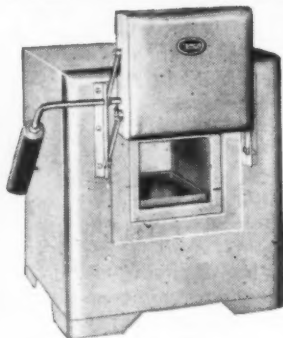
Designed for heavy-duty milling and die sinking operations, the improved Vertical Miller features "electronic" control for all feeds through a master control station containing spindle start, stop and jog pushbuttons, dials for controlling speeds of table, cross slide and vertical slide, selector switch for the two slides and emergency master stop pushbutton.

Centralized operating levers are with-



in easy reach of the operator. Table and cross slides have identical control systems with each consisting of an air-

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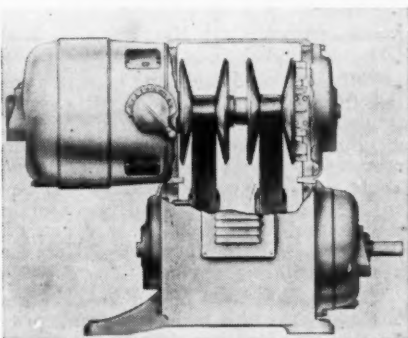
plane type half-handwheel and a ball grip lever. The half-handwheel gives an infinitely variable feed rate in either direction, and the five-position ball grip levers provide feed and rapid traverse in either direction.

Two 3 h.p., a.c. motors, one each for the table and the cross slide, provide the power rapid traverse motion, which has been increased in both models to 180" per minute. The feed rate is constant, preselected and controlled by the position of potentiometers located on the pushbutton station.

#### Dual belt variable speed motor

A line of extra heavy duty, variable speed motors with ratings as high as 50 horsepower, has been developed by U. S. Electrical Motors, Inc., 200 E. Slau-son Ave., Los Angeles 54, Calif. These units are part of the company's Vari-drive line. To carry the heavy load through the internal speed-changing transmission, U. S. engineers have incorporated dual varibelts, thus distributing the load so that no undue strain is imposed.

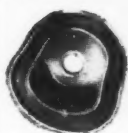
To counterbalance the belt load, a tension control known as Autotaut has been designed. This principle avoids the disadvantages of variable center drives or extra flexing of belts over idlers. A calibrated spring is employed



to maintain pressure between the two halves of the driven varidisks and the sides of the belt. The spring takes up any slack that might be caused by stretch or wear of the belts.

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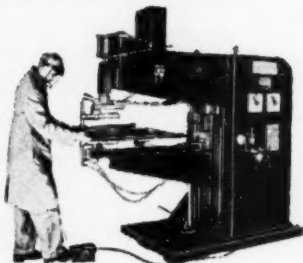


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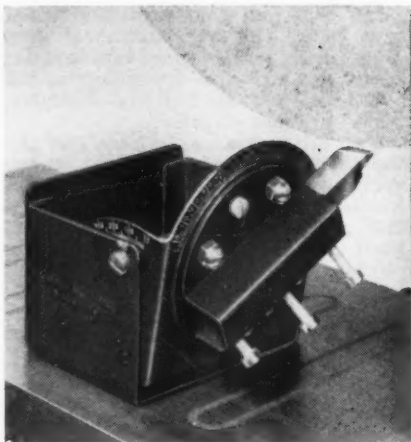


### Tool holder for power grinding

The new AccrAngle Grinder Attachment makes possible the grinding of cutting tools, threading tools, box tools, or any single point tool, any angle of rake or clearance, without removing the tool from holder, according to the manufacturer, Carl Nomann Co., 3537 Greenwood Ave., Los Angeles 22, Calif.

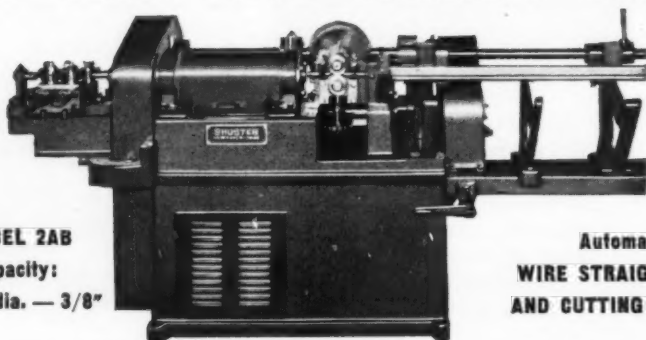
Fully patented and simply constructed, the AccrAngle Grinder Attachment is claimed to produce a precision tool grinding job, any angle on any side, in minutes. It holds any tool up to  $\frac{1}{2}$ ". Tools may be ground quickly and accurately simply by putting the tool in the holder, tightening the set screws, then adjusting the instrument for the desired grinding angle.

The attachment is useful for grinding one tool or many tools and small production grinding jobs, because it eliminates the old freehand method and elaborate set ups. The AccrAngle also makes it possible to grind duplicate angles on tools at any time. This new



instrument is of all steel construction with easily adjustable dials that enable the user to set it quickly for any angle of rake or clearance on any side of the tool to be ground.

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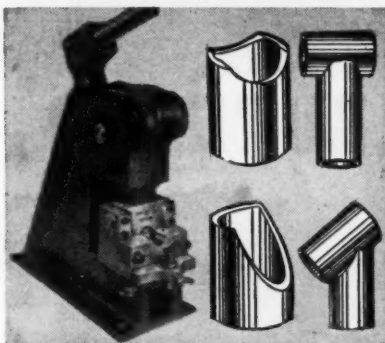
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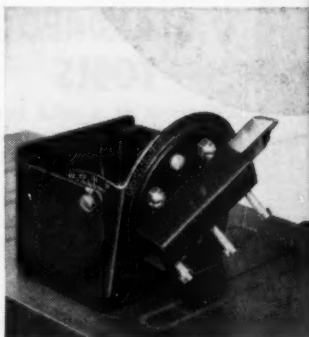
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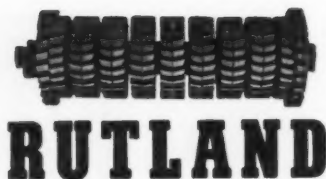
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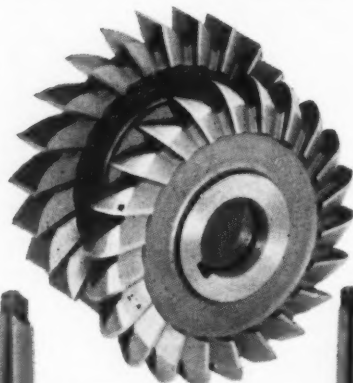
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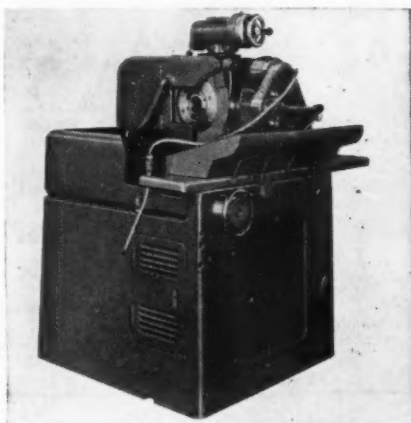
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### Landis knife grinding machine

The new Tool Slitter Knife Grinding Machine introduced by Landis Tool Co., Waynesboro, Pa., is designed to grind precision circular knives. It has many features designed exclusively for circular knife precision grinding. It may be used for manufacturing or resharpening circular knives.



Slitter knives are manufactured in many sizes, and in some cases, a radius forms the cutting edge. Precision slitter knives must have the two faces ground to the correct angular relation and concentric to each other. The cutting edge must also be concentric to the faces and bore. The radius cutting edge, when required, must be uniform and blend tangentially with the two sides.

The maximum diameter knives that the machine will grind with full size wheel is 6". This size permits a 170° oscillation of the work head. The minimum size knife is 1½" diameter with 145° oscillation. A 16" diameter grinding wheel with a 1" face is standard equipment.

The grinding wheel spindle runs in Microsphere Wheel Spindle Bearings. These bearings are one piece, steel, babbitt lined plain bearings, which are adjustable for clearance between spindle and bearing.

The grinder is equipped with an auto-

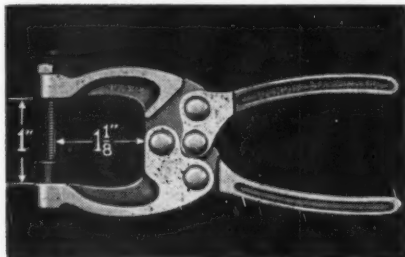
matic grinding wheel feed and includes a rapid infeed and retraction for wheel clearance and loading. The grinding feed provides a maximum of .035" slow feed movement. Both amount and rate of grinding feed are adjustable.

The work head is a special design for generating the accurate shape required in the production of knives with quality cutting edges.

The angle of the two faces is obtained by setting two stops, one for each face on the graduated scale provided on the swivel. The head is swiveled against either stop and that face is plunge ground. The wheel is retracted to the back position and the head is oscillated to present the opposite face to the wheel. The grinding operation is then repeated. The work head is then swiveled with the grinding wheel in forward position to qualify and form the radius on the cutting edge, if a radius is required.

#### Plier-type toggle clamp

A light, compact new portable plier-type toggle clamp, "De-Sta-Co" No. 424, is announced by Detroit Stamping Co., 347 Midland Ave., Detroit 5, Mich. The new fast-acting clamp is claimed to be particularly suitable for aircraft assembly, sheet metal and body work, and for holding metal, wood or plastic parts during machining, welding and cementing operations. It provides posi-



tive holding pressure with a firm toggle locking action. The clamp is light in weight, only 5 oz., making it useful for one-hand use, while its compactness (overall length 4 1/2") allows its use in restricted working area. Handles and jaws are forged high-alloy steel, and bearing pins are long-wearing stainless steel.

June, 1951



A development filling a distinct need. Produces remarkable results on real production work when abrasive rolls and pencils, also bands, etc., are used. Flexible air-control lever for starting and stopping. Husky, light weight, 14 oz. Power to spare. Special grease-sealed bearings. Will handle many applications, also with "High-Speed" Rotary Files.

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### Lapmaster attachments speed production of special parts

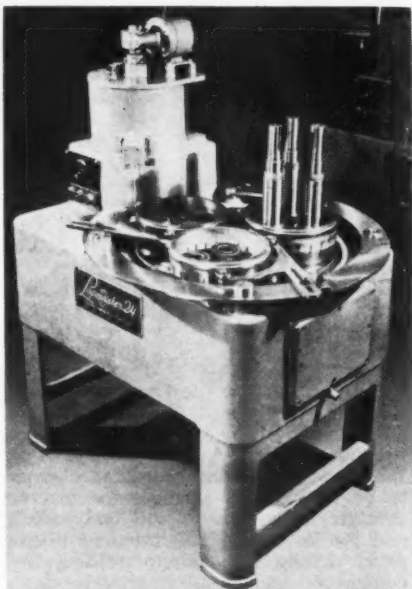
Two special standard attachments for the Crane Lapmaster enable users to speed production and simplify handling of certain types of parts. These developments, the "roller bar" attachment and pneumatic lifts, were introduced to bring a wider range of work to the point of practicality in lapping. The Lapmaster is made by the Crane Packing Co., 1812 Cuyler Ave., Chicago 13, Ill.

In the Lapmaster principle of operation, parts are held inside micarta workholders which fit into conditioning rings. These rings float on the lapping plate, and revolve on their own axis from the action of the rotating lap plate. Their function is to hold the work, and at the same time, continually condition the lap plate during machine operation—thus eliminating down time for dressing of the plate surface. Properly engineered compound-vehicle mixture is continuously agitated in a mixing tank, and flows automatically to the plate throughout the lapping cycle.

The above illustration shows the standard Lapmaster equipped with the roller bar attachment. This device was designed primarily to facilitate loading and unloading of tall or large parts. Instead of the standard overhead spider bar, it makes use of brackets mounted outside the circumference of the lap plate. Elongated slots allow adjustment of these conditioning ring holding brackets. Complete accessibility of the lap plate is afforded with this arrangement—the height of parts is unlimited

and in most cases, large heavy castings lap of their own weight.

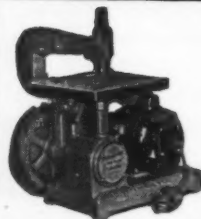
When large number of small parts must be lapped, the pneumatic lift attachment will speed production by facilitating loading and removal of parts and workholders. Each conditioning



ring and pressure plate unit is individually raised by a pneumatic lift. When the automatic lapping cycle stops, each lift is raised by pneumatic pressure, the lapped parts removed, and preloaded workholders placed in position.

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## DIE FILERS PROFILE GRINDERS



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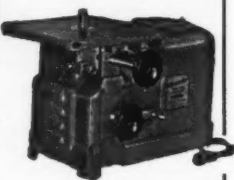
... features that result in higher efficiency, improved operating convenience and, most important, lower costs in your filing, sawing, lapping and grinding operations.

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# NEW *Commander*

## DRILL CHIP BREAKER



ORDINARY CHIPS

Get these **COMMANDER DRILL CHIP BREAKER** benefits now:

- Faster Drilling • Deeper Holes
- Better Holes • Longer Drill Life
- Safer, Cleaner Work
- **REDUCED DRILLING COSTS**

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**COMMANDER MFG. CO. 4227 W. KINZIE ST. • CHICAGO 24, ILL.**

Product of *Commander* ... Builder of Production Tools

## *How* **SQUARE HOLED SLEEVES SPEED UP TOOL-MAKING!**

One of the most difficult problems in tool making can be solved easily and quickly with **Sturdy Square Holed Sleeves**. The perfection of broached square holes can be had in boring bars, milling cutters and many other applications at a small fraction of the cost of imperfect hand-made square holes. The **Sturdy Square Holed Sleeve** consists of a round sleeve with a perfectly square hole broached through the center. The hole is tapped at one end to receive a back-up screw which is furnished with the Sleeve. The Sleeve can be sweated or pressed into a drilled and reamed hole to make a perfectly square accurate hole in a very few minutes.

The **Sturdy Square Holed Sleeve** will save you many hours and many dollars in the making of boring bars, tool holders and other tools requiring square holes.

**BUSHINGS MADE IN  
FOLLOWING SIZES:**

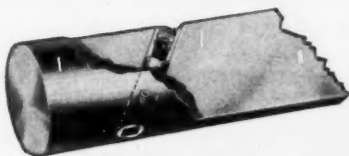
3/16, 1/4, 5/16, 3/8,  
7/16, 1/2, 5/8, 3/4, 1"

**STURDY BROACHING SERVICE**

23516 TELEGRAPH RD., DETROIT 19, MICH.



Patents Pending

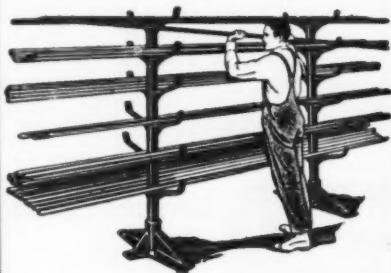


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Literature*



## SPEEDS UP STOCK-ROOM SERVICE

The BROWN TIME-SAVING RACK saves the time previously lost end-hauling each bar of stock its entire length from the old-style, closed-side Rack, the Brown Rack requiring but a few inches of side movement. Each length, width and thickness of stock is displayed in gold-fish visibility for instant selection. Workmen waiting for stock are served without waste of time, and returned to their production machines to turn out a maximum of output.



Any time you require additional storage space, all you need do is add more units. If you want to relocate it at any time, you can do so quickly for it is unattached to the building. It is a simple, durable article made of metal in five styles. It can't burn, warp, sag or twist; depreciation is practically nil.

SEND FOR BULLETIN No. 26-M DESCRIBING—

BROWN'S *QUICK-SERVE* RACKS

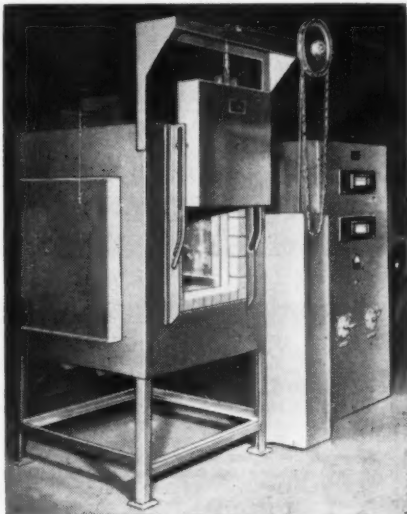
**BROWN ENGINEERING CO.**

126 N. THIRD ST. READING, PA.

RACKS • VISES • CLUTCHES • COUPLINGS

## Pereny heat-treating furnace for heavy-duty operation

A spacious work chamber, accurate temperature controls, and versatile operating features make the new Pereco Model FG-7800 Electric Furnace useful for heavy-duty heat-treating work, according to its manufacturer, Pereny Equipment Co., 893 Chambers Road, Columbus 12, Ohio. It handles all heat-treating temperatures up to 2500° F., with a maximum of 2700° F. and can be supplied completely gas-tight with atmosphere connections.



The separate control panel is equipped with a voltage-regulating, multi-tap transformer, a temperature indicator and controller, a magnetic contactor, and a high limit cut-off which acts to safeguard the furnace from accidental overheating.

The dimensions of the Model FG-7800 are 33¼" wide, 39¼" long, and 64" high; the loading area is 18" wide, 24" long, and 18" high. This heating chamber is thickly insulated, and the wedge-action door seals the opening. The steel outer case is electrically welded and reinforced. A chain hoist provides vertical operation for the insulated door.

The heating elements used in this

# Make A Clean Impression!

## Hand-Cut STEEL STAMPS

### Letters & Figures



Deep, hand-cut letters in special-formula steel assure clean impressions and long service. Face of stamp is angled for extra strength. Chamfered corners for locating the base. Ask for Hoggson Brand at mill supply houses.



**HOGGSON & PETTIS MFG. CO.** 141-H BREWERY STREET  
NEW HAVEN, CONN.

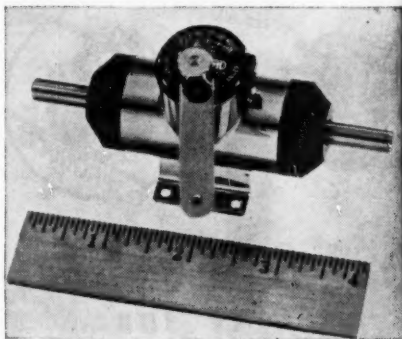
furnace are the Global silicon carbide type, to reach and maintain temperatures uniformly at all levels within its range. The maximum connected load is 34.5 KW. Operating current is 220 volts, 3-phase.

### Metron miniature speed drive

The Metron Instrument Co., 432 Lincoln St., Denver 9, Colo., has introduced a new miniature variable speed drive with lever type speed control. The new type 4B is the same size and construction as the original type 4A which has thumb screw speed adjustment. This small, compact, sealed unit has ratings up to 2-pound-inches of torque, 0.025 h.p., 20,000 r.p.m., and the ratio is infinitely variable from 1/16 to 6.

The Model 4B is useful in applications requiring remote or automatic control. By applying linkages or cams, a variety of control techniques is possible. The actuating lever carries a pointer which indicates ratio setting on top of the unit. However, remote ratio indication can be obtained by means of a scale

associated with the remote actuating speed adjuster. Speed is adjusted by changing the radius at which rollers make contact with discs, and in the case of the type 4B, the rollers are directly turned by the lever control. Thus, lost motion is held to be minimum.



Applications include timers, recorders, computers, indicating mechanisms, and similar low power devices.



Produce your small precision parts with well-known "DERBYSHIRE" accuracy

Illustrated:

The DERBYSHIRE ELECT lathe with 18" bed; ball-bearing headstock with collet closer attachment; double compound rack-and-pinion slide rest with front tool post slide graduated to swivel 360°; six-position turret to take standard tools.

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**F. W. DERBYSHIRE, INC.**  
WALTHAM 54, MASS. 157 HIGH ST.

**ECONOMY**  
HEADLESS AND  
SOCKET SET SCREWS

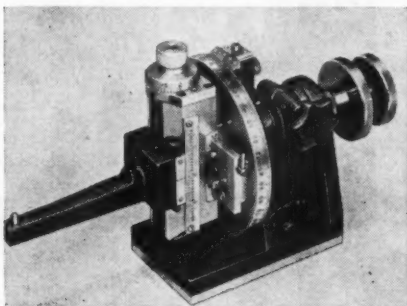


**TRY THEM ON YOUR  
NEXT JOB**

**ECONOMY MACHINE PRODUCTS**  
5212 LAWRENCE CO. CHICAGO 30, ILL.

### Angle tangent-to-radius dresser

The Tangi-Matic Dresser for precision dressing of all angle-tangent-to-radius grinding wheel forms is introduced by Perfex Tool & Gage Co., Dept. Y, 123 Avery St., Mount Clemens, Mich.

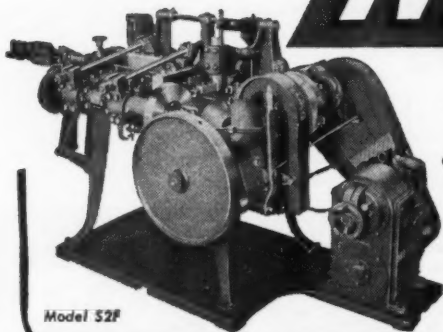


According to the manufacturers, set-up time is reduced to one-fourth the time usually required by experienced tool-makers, since it eliminates Jo blocks, height gages, micrometers or other precision instruments. A built-in micrometer provides direct reading, rapid adjustments and accuracy down to "tenths," it is said. Setting for required angles is provided by a vernier scale, graduated in minutes. Two stop dogs control the desired arc. The Tangi-Matic dresses concave radii as small as .032", a full 180°, using the small radius attachment furnished.

To set for "0" radius, the diamond is locked to the height of the master setting gage, with vernier and micrometer both turned to "0". Settings to radii desired are made from this position, each revolution of the lead screw moving diamond .050". The Tangi-Matic dresses from the bottom of the wheel, the company points out, where the grinding actually takes place, permitting the operator to control the wheel accurately by using the grinder draw feed.

All wearing parts of the Tangi-Matic Dresser are steel, hardened, ground and lapped. The micrometer lead screw is hardened and precision ground. Durable wooden case contains the Tangi-Matic, master setting gage, small radius attachment and dustproof cover to protect instrument while in use.

# TRULY—THERE'S *NOTHING LIKE A* **NILSON**



Model 52F

**For Rapid,  
Accurate, Automatic Production**

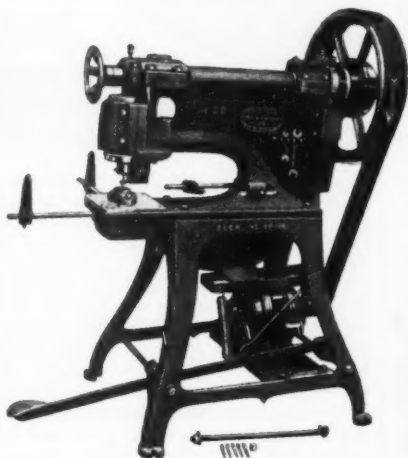
• **Combination Press and  
4-Slide Forming Machine**

Extra rigid construction; tooling costs are generally lower; forming tools are interchangeable and easy to adjust. Send for catalog.

**A. H. NILSON MACHINE CO.**  
**BRIDGEPORT 5, CONN.**

Automatic Wire and Metal Forming Machines • Staple Forming Machines • Chain Making Machinery • Foot and Power Presses • Wire Reels • Wire Straighteners.

**SPECIALISTS IN WIRE FORMING EQUIPMENT FOR OVER 50 YEARS**



No. 20 Deep Throat Power Punch and Press

*Write  
US ABOUT  
This Machine  
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System  
of efficiency  
Punching  
Sheets in Duplicate  
Thousands  
All Over the  
World*

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**EXCELSIOR TOOL & MACHINE CO., EAST ST. LOUIS, ILLINOIS**

# Buy KIPP AIR GRINDERS Because

The RPM's stay up while grinding... not only when the grinder runs idle.

It is an established fact that surface speeds must stay up to approximately a mile a minute if you want to grind — not just rub. The speed of Kipp air grinders drops but slightly when put to work. That means better work — longer wheel life.

*Buy Kipp air tools for best results, lower prices.*

MODEL JA  
50,000 R. P. M.

**\$42<sup>00</sup>**

IN U. S. A.



Weight 12 ounces;  
length 6 $\frac{3}{4}$  inches;  
chuck size  $\frac{1}{8}$  inch.  
Wheel guard re-  
moved for better  
illustration.

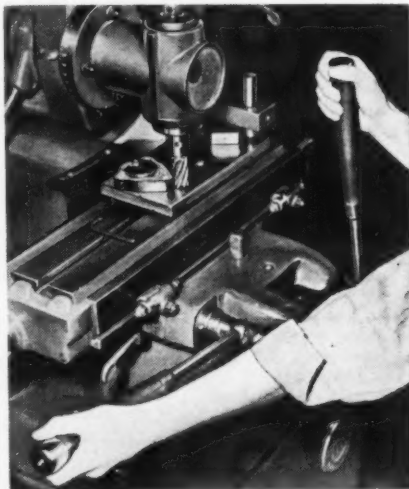
**MADISON-KIPP CORP.**

207 Waubesa St., Madison, Wis., U. S. A.

- Skilled in DIE CASTING Mechanics
- Experienced in LUBRICATION Engineering
- Originators of Really High Speed AIR TOOLS

## Nichols vertical milling attachment

W. H. Nichols Company, 48 Woerd Ave., Waltham, Mass., announces a new Vertical Milling Attachment which converts standard horizontal Nichols Millers for precise diversified vertical milling operations. It is sturdy and accurate, and designed to take full 1 h.p. drive, with maximum speeds up to 2000 r.p.m. The national distributor for the device is Nichols-Morris Corp., 50 Church St., New York 7, N. Y.



The Vertical Attachment consists of a heavy one-piece casting which houses the entire mechanism. Accurately machined alignment pads on the body casting allow for easy mounting in a vertical plane. The hardened and ground drive shaft is mounted in precision double row ball bearings, and the vertical spindle in Zero Precision Timken bearings at both ends. Spiral bevel drive gears are heat treated and carefully fitted to assure smooth operation, and lubrication is amply provided for.

The spindle of the unit is hardened and ground with maximum allowable runout held within .00015" full indicator reading. The vertical spindle nose is identical with the horizontal spindle nose, bored No. 40 National Standard

# People work better when they SEE BETTER



#### MAGNI-FOCUSER's

matched prismatic lenses give needle-sharp magnification. Comfortably light weight. Fits over regular glasses. Leaves both hands free. Normal vision resumed by lifting head.

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Precision workers do the job faster and more accurately with a Magni-Focuser — the proven binocular magnifier.

Gauge reading, layout work, inspection, tool and die work are just a few of the jobs that need the Magni-Focuser. Speeds precision assemblies, blue print work. Restores the usefulness of the skilled hands of many older workers whose vision needs a seeing aid.

Now aiding thousands of workers, the Magni-Focuser can help your plant produce better. Immediate delivery. 10-day trial without obligation. Return to us if not satisfied. \$10.50.

Send for descriptive folder.

### EDROY PRODUCTS CO.

480 Lexington Ave.,  
Dept. 14, New York 17, N. Y.

Taper, and thus will interchange all tooling. A standard drawbolt is furnished, and a draw-in collet attachment is also available.

The Vertical Attachment is mounted in a circular tee-slotted adapter plate, which encompasses the horizontal spindle nose, and is held securely by four bolts. It may be swiveled around the horizontal spindle if desired, and suitable graduations in degrees are provided. The Attachment is driven through a splined adapter in the mouth of the horizontal spindle. Spindle speeds of the Vertical Attachment are one-third higher (4:3 ratio) than available horizontal spindle speeds. Vertical spindle speeds exceeding 2000 r.p.m. are not recommended.

#### Black granite surface plate

A new type of precision plate made of black granite, with accuracy up to 50 millionths of an inch (.0000050"), has been developed by Collins Granite Surface Plate Co., 1331 Santa Fe Ave., Los Angeles 21, Calif. Its surface is claimed to be harder than tool steel.

It is non-magnetic, non-deflecting, non-glaring, and requires no oiling. Known as the "Micro-Flat," this black granite plate provides bench workers engaged in tool and die making, inspection, and

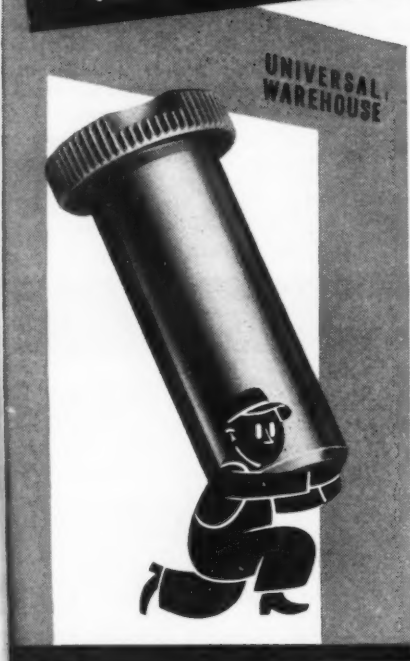


precision instrument assembly, a means of laying out work on an incredibly smooth surface which is non-erosive.

The Micro-Flat is available in sizes from 9" x 12" to 54" x 108".



**LONG-LENGTH BUSHINGS  
ARE STANDARD AT  
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NO WAITING  
FOR PRODUCTION**



All long-length bushings listed as standard in the Universal Catalog are regular stock items, which means speedier delivery to you.

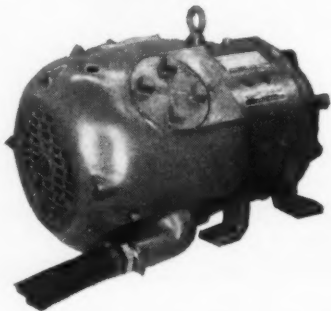
146B

**UNIVERSAL  
ENGINEERING COMPANY  
FRANKENMUTH 10, MICHIGAN**

### **G. E. explosion-proof mining motors**

A new line of explosion-proof mining motors, conforming to the Bureau of Mines Schedule 2E, is announced by General Electric's Small and Medium Motor Divisions, Schenectady 5, N. Y.

The new line is available in ratings from ½ h.p. through 60 h.p. at 230, 250, 500, and 550 volts, with stabilized shunt, compound, or series windings. According to G-E engineers, the motors incorporate many special features which contribute to longer life and easier maintenance.



All frame sizes in the line utilize two stud brush mechanisms. With this construction, all brushes are accessible through two large handhole covers in the upper half of the commutator end shield, facilitating inspection and brush replacement. Non-rusting cast bronze handhole covers with heavy integral lugs resist corrosion and do not require special tools for removal. The motors also use a cable gland design which permits cable replacement without removing the end shield or working through the commutator access openings.

High dielectric insulation is applied to the coils with a vacuum impregnating process using Glyptal\* synthetic resins to insure maximum penetration.

Standard motors are foot mounted, but modifications can be supplied less the feet for strap mounting, or with a face or flange end shield.

\* Reg. Trade-Mark of the General Electric Co.

# The internal gage that's RIGHT for war production conditions **COMTORPLUG**

Gages precision bores to fractions of .0001"

War production conditions intensify the need for a gage that gives high precision yet is Rugged, Automatically Accurate, "Unrestricted".

Patented COMTORPLUG answers the need as no other gage can because:

- 1) Withstands typical shop use at machine or inspection bench, without lessening precision.
- 2) Trainees equal old hands in precision results, due to automatic alignment and "feel".
- 3) For Quality Control, gives actual measurement, and a fixed- not passing—reading.
- 4) Available anywhere instantly. Weighs but a few ounces. No hose, wire, or "10-ton base".
- 5) Cost is so reasonable as to be practical for all quantity gaging applications. Fits in with other gaging methods. Let it grow as it proves itself—which it WILL!

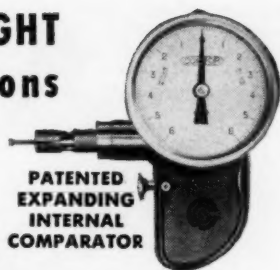
## COMTOR CO.

62 Farwell St., Waltham 64, Mass.

Request  
"Bulletin  
40"



For data on COMTORGAGE Precision External Gage, request Bulletin 30.



**PATENTED  
EXPANDING  
INTERNAL  
COMPARATOR**

1/8" to 8" dia.



Inspection to fractional ten-thousandths of hydramatic airplane propeller distributor valve.



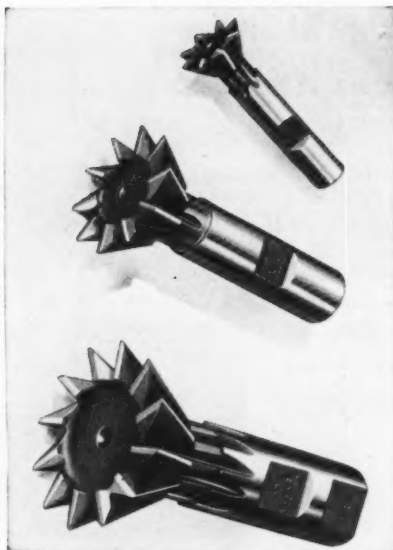
## Cut grinding costs . . . with rugged **QUEEN CITY Grinders**

Queen City Grinders are built to stand up under the heavy work that pours through the shop daily. Noted for their durability, freedom from downtime and low cost, Queen City Grinders cut grinding costs to the bone. • Order today a battery of these low cost grinders and eliminate "ganging up" around one lone grinder.

**QUEEN CITY  
MACHINE TOOL CO**

**QUEEN CITY  
Machine Tool Co.**  
235 E. 2nd St.  
Cincinnati 2, Ohio





## Dovetail Cutters by Reltool... Available from Stock

Order these shank type dovetail cutters from your industrial distributor, or direct, for use in Reltool and other standard End Mill Holders. May be used in place of arbor-type and threaded-hole angle cutters. The ideal tool for milling dovetails with less set-up time, easier handling.

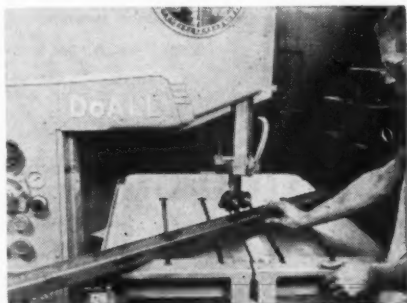
**The Reltool Line Includes:** Arbors • Center Drills • Counterbores • Die Sinking Cutters • Dovetail Cutters • End Mills • Form Tools • Gear Cutters • Hollow Mills • Keller Cutters • Key Seat Cutters • Lathe Mandrels • Metal Slitting Saws • Milling Cutters — all types • Reamers • Spottacers • Step Drills • Taps • Tool Bits • Specials. Write for Catalog 50.



4540 W. BURNHAM ST. • MILWAUKEE 46, WIS.

## 30° angle saw guide blocks

The DoAll Company, Des Plaines, Ill., whose standard models for contour machining and high speed or friction band sawing range from 16" to 60" in throat capacity, announces the availability of angle saw guides that adapt all models to cut-off work of any length. Angle guide blocks add to the vertical band-saw's versatility. They get around the work length limitation imposed by the machine's throat capacity, that is, the distance between the saw band and the column of the machine.



For example, a 36" throat machine with standard guides can cut-off a piece of stock only 36" long. However with 30° angle guides, there is no limit to the length of extrusions or bar stock that can be handled and with these guides, a piece of stock as much as 15" in diameter can be cut off square or at any desired angle and with no limitation on length of the piece to be cut.

The following figures illustrate the increased sawing capacity and utility provided through use of 30° angle guides:

DoAll Machine throat capacity	Cut-off capacity with Angle Guides
16"	6½" dia. or stock width
20"	7½" dia. or stock width
26"	9½" dia. or stock width
36"	15¼" dia. or stock width
60"	26¼" dia. or stock width

For DoAll Utility models and the standard Contour machines with tool speeds of 50 to 1500 f.p.m., there are 30° angle insert type guide blocks. For the Zephyr high speed bandsaws there are 30° insert type and also 45° angle roller type available. For the DoAll Contour-matic,

the hydraulically operated machine for all types of band machining with speed ranging from 40 to 10,000 f.p.m., there are three types of angle guides: 30° insert type for blades up to ½" width, 35° roller type, for high speed operation with blades up to 1" wide, and 45° insert type for use with ⅝", ¾" or 1" wide blades at conventional metal sawing speeds.

#### **Tungsten carbide rotary cutters**

S & E Machine Products, Inc., Bridgeport, Mich., announce a new line of Tungsten Carbide Rotary Cutters. Ten shapes are offered, each in head diameters of ⅛", ¼", ⅜" and ½". The ⅛" dia. and ¼" dia. tools are solid tungsten carbide. Heads of the ⅜" dia. and ½" dia. tools are of solid tungsten carbide, butt-brazed to the shanks by a special process that is stated to offer extraordinary strength. The manufacturer guarantees replacement of any of the new tools that, under ordinary use, fail at the braze.

All the new cutters are completely form cutting, with cutting edges fol-

lowing the entire form. Heads are form ground concentric with the shanks, permitting their use in machine tools at high speeds and feeds.



These Tungsten Carbide Rotary Cutters are available individually and in sets. Sets are available in the four standard diameters and consist of one each of the ten shapes.



Send for our 32 page catalog of Vises, Work Positioners and Industrial Clamps.

*Sold Thru Distributors*

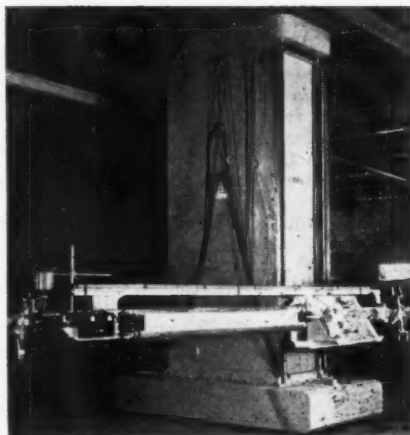
**WILTON TOOL MFG. CO.**

925-E Wrightwood Avenue  
CHICAGO 14, ILLINOIS

## Movable gantry for melt welding

A new type of movable gantry for automatic submerged melt welding has been developed by the Reed Engineering Co., 1003 W. Fairview Ave., Carthage, Mo. Maximum flexibility is provided by installing the welding generator or transformer and flux recovery unit within the gantry column, leaving only the initial electrical power supply to be brought into the fixture through drag cables or trolley bars.

The gantry moves on standard gauge railroad track through a variable speed range that may be as high as from 5" to 320" per minute. The welding boom, which is designed to mount any standard automatic welding head, is powered for vertical adjustment up to 12-foot vessel diameters. The boom is retracted through a variable speed power source, permitting the welding of 10-foot seams at right angles to the gantry track. Dual controls are provided so that all movements may be operated from the end



of the welding boom or from the base of the gantry. Variable speed turning rolls are available to handle vessels up to 100 feet in length.

## Dependable MEASURING & CHECKING EQUIPMENT

and Now

HAND WHEELS, KNOBS, HANDLES

**Cadmium Plated** READY TO DELIVER

Non-rusting — good looking



STRAIGHT and OFFSET TYPE



CAST IRON

SOLID ROTARY MACHINE HANDLES



MALLEABLE IRON

We also build jigs, fixtures, special tools and machinery. Send us your blueprints.



UNIVERSAL ANGLES

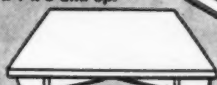
In 10 sizes, ranging from 4 x 3 1/4 x 5 and up.

BOX PARALLELS

In 15 sizes, ranging from 3 x 4 x 12 and up.

SLOTTED ANGLES

In 19 sizes, ranging from 4 x 9 x 5 and up.



SURFACE PLATES

Over 30 sizes, ranging from 7 x 7 1/2 to 96 x 192.

Send for Complete Catalog

**MACHINE PRODUCTS CORPORATION**

6771 E. McNICHOLS ROAD

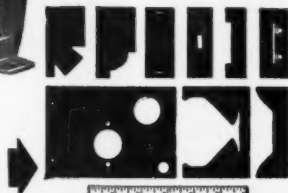
DETROIT 12, MICHIGAN

## BLANKING, NOTCHING,

LESLIE MODEL A  
HAND PUNCH PRESS  
\$120.00 F.O.B.  
CHICAGO



Diagram illustrates versatility of Press—each blanking done with 1 stroke.



## PARTING, EMBOSSING ?

- FAST DIE CHANGES, with standard Punches and Dies.
- 15 Ton capacity.
- Patented Leaf Assembly provides accurate punch and die alignment.
- 6" throat depth permits reaching to center of 12" piece.
- Large Punch Plate and Bed permits blanking over big areas.

Write now for illustrated catalog and circular showing punches and dies available from stock.

Tool your jobs at low cost from our wide variety of standard punches and dies.

LESLIE WELDING CO., 2941 Carroll Ave., Chicago 12, Ill.



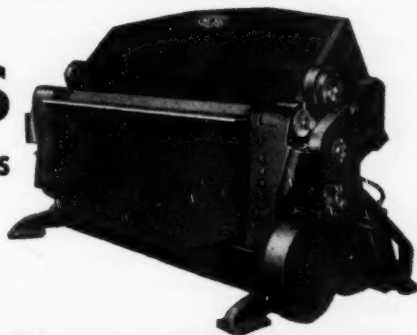
STEEL HAND and POWER

## BENDING BRAKES

for Single and Quantity Runs

BENDING STEEL PLATE  
and SHEET METAL

Special Bending Brakes  
Double Folder Brakes



**DREIS & KRUMP**  
MANUFACTURING COMPANY

7440 S. Loomis Boulevard, Chicago 36, Illinois





**SAVE SET-UP TIME...**



**with "DE-STA-CO"  
ARBOR SPACERS and SHIMS**

IT COSTS YOU MONEY when machinists waste time hunting for arbor spacers. **SAVE TIME** with two sets of "De-Sta-Co" Arbor Spacers for every milling machine in your shop.



**ARBOR SPACERS**  
Keywayed



**SHIMS**  
Not Keywayed

Handy sets available for 20 arbor diameters ( $\frac{3}{8}$ " to 4"), 19 graduated thicknesses (.001" to .125") with standard keyway. Shims same sizes, without keyway. Sets sealed in clear polyethylene envelopes, with size plainly marked. Specials, over .125" thick, available in popular arbor sizes and thicknesses, machined from bar stock, hardened and ground, with standard keyways, identified as to thickness.

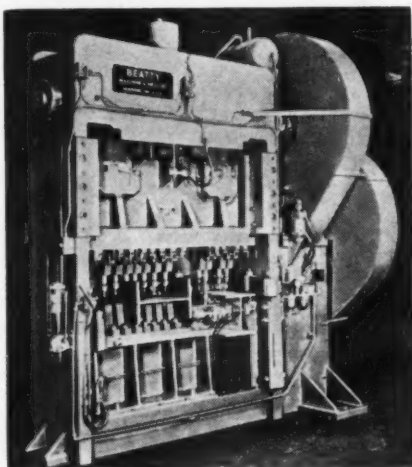
Machinists prefer durable "De-Sta-Co" steel Arbor Spacers and Shims for milling, slitting and gang-saw setups and for shimming gears and bearings. **YOUR SHOP SAVES**, too, when each machine has two sets handy for speedy setups. Ask your mill supplyhouse for them by name, "De-Sta-Co", or write for Spacer and Shim Stock Price List.

**DETROIT STAMPING COMPANY**

347 MIDLAND AVE. • DETROIT 3, MICH.

**Beatty guillotine beam punch**

A new Guillotine Beam Punch for punching flanges and webs of beams 6" to 30" is announced by the Beatty Machine & Mfg. Company, Hammond, Ind. The machine, of particular interest to structural steel shops, offers several design advantages, including greater rigidity, reduced punch wear, lower manufacturing costs, more positive alignment and a saving in floor space.



With the guillotine design, deflection is straight up and does not cause a buckling effect on punch and die units, thus the rigidity is greater and the alignment more accurate. The No. 9 Punch illustrated, of 200-ton capacity, will punch four 15/16" diameter holes through 11/16" mild steel plates. Additional holes are punched by staggering the lengths of punch stems. Die levels are the same for punching both flanges and webs of beams, enabling the user to punch wide plates the full length of the ram.

The machine illustrated is complete with bolsters, four punch units for flange punching and eight punch units for web punching, and air cylinder positioners for web and flange punch gauging of the beams. Strippers are adjustable for different thicknesses of metal. Motor drive is V-belt to flywheel

face. Drive shaft bearings are anti-frictional type. Lubrication is either by oil cups or centralized, manually operated. A full punching load may be taken at either end or at the center of ram.

Clutch operation is by means of push button controlled solenoid air valve and cylinder, resulting in lower operating fatigue factor.

The new punch is available in three sizes—No. 8 for beams up to 24", No. 9 for beams up to 30" and No. 11 for beams up to 36".

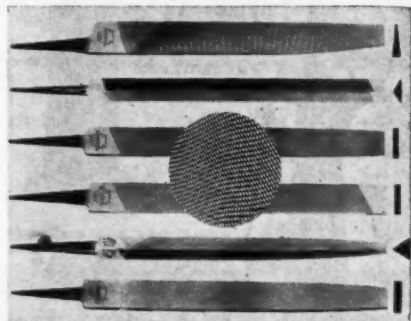
#### Disston staggered-tooth files

Extension of the staggered tooth principle to its entire line of double-cut files, and improvements in the design of its taper files are announced by Henry Disston & Sons, Inc., 1149 Tacony St., Philadelphia 35, Pa.

Introduction of the original staggered tooth Bite-Rite file marked a radical innovation in file design, since it meant that files could be operated on the principle of cutting rather than scraping. Overlapping teeth meant a smoother

cut; undercut teeth resulted in faster removal of chips; and the open gullets gave longer life to the files.

Disston's high inspection and quality standards will be maintained, and single-cut files, suitable for work of great smoothness and precision, will continue to be produced as before. At



the same time the company announced that its single-cut taper files have been improved and strengthened on the edge by a design change, assuring longer life.

## Beverly THROATLESS SHEAR *Cut any Shape...* STRAIGHT OR IRREGULAR



Model B-3 with  
Ball Bearing  
Hold Down

Make straight or intricate cuts in the lightest metals without distortion, yet handle heavier gauges with ease on a Beverly. Smooth, powerful, clean cutting action.

Made in 4 sizes to handle 18 ga., 14 ga., 10 ga., and 3/16" mild steel. H.C.H.C. Blades available for cutting stainless steel.

#### NEW WIRE ROPE AND CABLE CUTTER

Cuts wire rope and heavy electrical cable at one stroke. Circular cutting action assures finished cut at one stroke. Snap-Action Hold Down permits instantaneous adjustments for varying sizes. Capacity: wire rope 1 1/16"; aperture 1". Weight 36 lbs.; base dimensions 8" x 5".

Write for illustrated circulars on Beverly Cost Cutting Tools.



BEVERLY SHEAR MFG. CO., 3005 W. 111th St., Chicago 43, Ill.

# GRANT

## RIVETERS...

**PIONEERS  
and  
PACEMAKERS  
in their line**

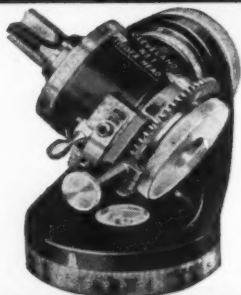


—head rivets from smallest to  $\frac{1}{2}$ " diameter either by NOISELESS SPINNING or VIBRATING HAMMER method—Sizes to meet all needs—types include Vertical and Horizontal Multiple Spindles.

Write for literature and don't forget to send samples.

**THE GRANT MFG. & MACHINE CO.**  
C E Station, Bridgeport 5, Conn.

## TOOL HOLDER INDEXING HEADS



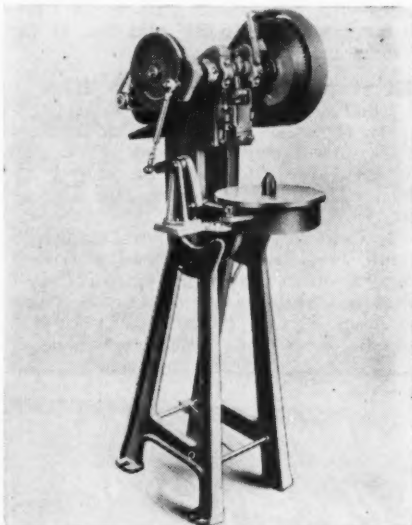
Holds  $\frac{1}{16}$ " up to  $1\frac{1}{2}$ " Tools  
5C or 1AM Collets and Brown & Sharpe or Morse Taper. Will adjust to any compound angle.

**GRINDERS & FIXTURES INC.**

8327 Clinton Road Cleveland 9, Ohio

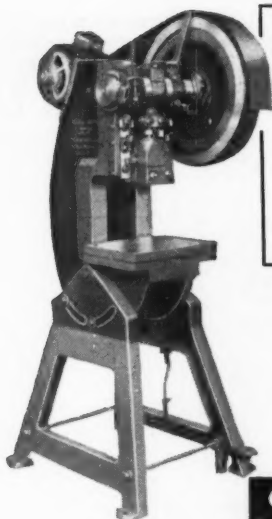
## Dial feed punch presses

O. F. de Castro & Associates, 1517 S. Santa Fe Ave., Los Angeles 21, Calif., announce the new "Speedex" 5-ton Dial Feed Punch Press. The "Speedex" is a 5 ton back geared open back inclinable punch press. The frame is heavy semi-steel. All bearings are bronze bushed. The back gear housing is a



heavy semi-steel casting with alloy shaft on sealed ball bearings. The teeth on the main gear and pinion are precision cut. The press is available in either 1" or 2" stroke. The dial feed is mounted directly on the frame of the press and connected to the crankshaft by means of an adjustable rod with an eccentric drive.

The timing on the index feed is adjustable by rotating the timing cam on the crankshaft of the press. The "Speedex" Index Feed, is positive acting, accurate to .0002" and has a locking arrangement by which it locks in position at each stroke of the press, and remains locked while the press is doing the work. These Dial Feed Presses can be furnished with either 12", 15" or 24" diameter index feeds.



7 Models  
5 to 85 Ton

GET MORE FROM YOUR MATERIAL . . .  
Specify

## PRESS-RITE 15 TON POWER PRESSES

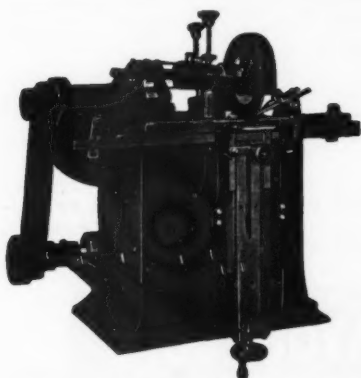
You're sure of higher production and reduced scrap when you install Press-Rite Power Presses. Extra heavy frame and crankshaft. Triple ram-way lubrication. Available with longer stroke than standard, at small additional cost.

Write for bulletin P650 today!

*Sales Service Machine Tool Co.*



2357 UNIVERSITY AVENUE  
ST. PAUL 4, MINNESOTA



**WARDWELL EC Combination Grinder,  
Hack, Circular and Band Saws**

The only single unit grinder adaptable for hack, band and circular saws that does not depend on the shape of the grinding wheel to form the shape of the tooth. This unique feature enables operator to grind a variety of blades without dressing or changing wheels.

## Improves sharpness of new blades . . . cuts more metal in resharpening

New hack saw blades are usually not ground after hardening. That is why blades resharpened on Wardwell EC Grinder are better than new.

Ordinary blades are junked after two or three sharpenings. Because of its precision EC resharpens them at least six times and thus returns its cost on blade purchases alone. Write for Bulletin EC. Wardwell Mfg. Co., 3165 Fulton Road, Cleveland 9, Ohio.



Maker of largest line of  
saw and tool sharpening machines

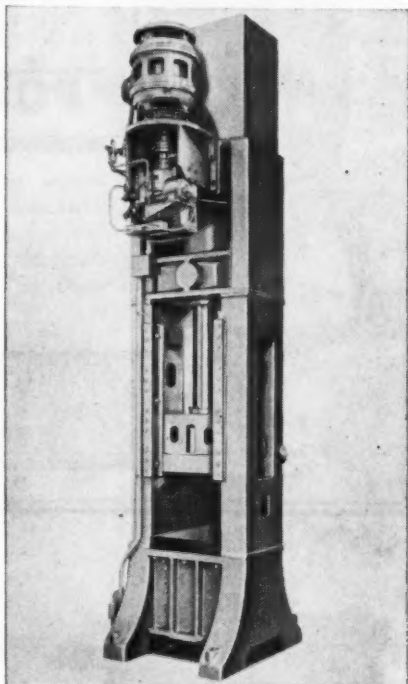
## Elmes "pipeless" circuit hydraulic presses

Development of a new principle in hydraulic press construction is announced by Elmes Engineering Division of American Steel Foundries, 1171 Tennessee Ave., Cincinnati 29, Ohio. In the new "Pipeless" Metal Working Presses built on this principle, the main hydraulic circuit has no piping. The only pipes in the entire press are the pilot, suction, and drain lines, and of these, only the pilot line carries high pressure. All high-pressure fluid is conducted through short, direct passages drilled in the structural parts. There are no high-pressure screwed joints to loosen, no oil dripping from loosened fittings, and no possibility of welded joints breaking loose. Smooth and shockless operation virtually eliminates vibration. The illustration shows the rear view of an Elmes Drawing and Forming Press, with the new pipeless circuit construction.

These advantages over the conventional hydraulic system permit low-cost maintenance, with downtime practically eliminated. The pumping unit can be removed as a unit assembly without disconnecting any piping. The valve unit, in the oil reservoir, is also removable as a unit assembly. All pumping units and valve groups fit standard bolting and drilling layouts.

The new Elmes pipeless construction is stated to make press operation decidedly quieter. The pump is supported in a heavy cast steel bracket flange-mounted to the press cylinder, muffling and suppressing noise.

Reversing type hydraulic pumps known to give smooth press performance, are used in the new circuit. Even the shifting and centering system is a miniature pipeless circuit. Since this



unit is mounted directly to the hydraulic pump, only electrical or mechanical connections need be made, depending upon the style of control.

**MACHINISTS—TOOL AND DIE MEN—SHEET METAL WORKERS—ETC.**

# FREE SAMPLE BLUE LAYOUT DOPE

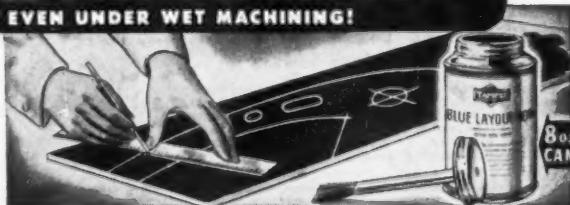
**STAYS PUT EVEN UNDER WET MACHINING!**

Speeds layout on all metals. Dries fast. Oil resistant. Won't chip, crack or flake off. Comes in handy 8 oz. brush-in cans, etc., etc., drums. Order now!

**TAMMS INDUSTRIES, INC.**

(formerly Tamms Sillies Co.)

226 N. LaSalle St., Chicago 1, Ill.

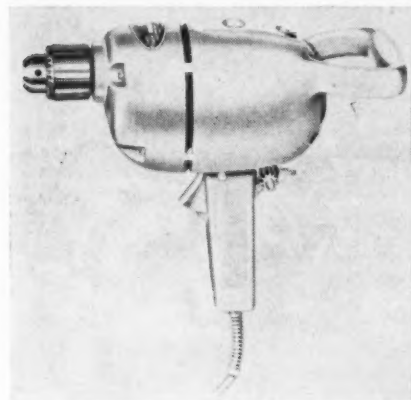


The pipeless valve unit contains all necessary provisions for pre-filling during rapid advance, changing to pressing speed by either pressure or position, and decompression prior to reversal. These valves are designed in a wide range of sizes for application to many different speeds and tonnages.

### Cummins super-special 1/2" drill

Built to give extra drilling speed and longer life, the Model 225 1/4" Super-Special Drill is presented by Cummins Portable Tools, Division of Cummins-Chicago Corporation, 4740 N. Ravenswood Ave., Chicago 40, Ill., in its new "Tools for Industry" Line.

Equipped throughout with fine quality anti-friction bearings, the Model 225 is designed for sever, rough service in factories, shops and major construction operations.



The specifications of the drill include a capacity of 1/2 inch in metal and 1 1/2 inches in hard wood; a no-load speed 550 r.p.m.; a Universal a.c.—d.c. motor up to 60 cycle, 115 volts, 220 volts special; high grade ball and roller bearings; double reduction gears of fine alloy steel, helical cut and hardened, for smooth, quiet operation and long life; a 2-pole switch, momentary contact with lock for continuous operation; a Model 33B Jacobs geared chuck, key mounted on the drill handle with spring clip; a strong, light die-cast aluminum frame; a 10-foot, 3-conductor cord with rubber plug and pigtail for ground.

## BARGAINS! LONG DRILLS

9" FLUTE  
12" HIGH SPEED 12"

Size	Price Each
1/8" x 12"	\$2.06
9/64" x 12"	2.06
5/32" x 12"	2.06
11/64" x 12"	2.06
3/16" x 12"	2.06
13/64" x 12"	2.19
7/32" x 12"	2.19
15/64" x 12"	2.40
1/4" x 12"	2.40
17/64" x 12"	2.55
9/32" x 12"	2.55
19/64" x 12"	2.75
5/16" x 12"	2.75
21/64" x 12"	3.11
11/32" x 12"	3.11
23/64" x 12"	3.46
3/8" x 12"	3.46
25/64" x 12"	3.81
13/32" x 12"	3.81
27/64" x 12"	4.17
7/16" x 12"	4.17
29/64" x 12"	4.52
15/32" x 12"	4.52
31/64" x 12"	4.52
1/2" x 12"	4.52



## DIAMONDS BARGAIN PRICES

KNOWN FOR THEIR PRECISION AND DEPENDABILITY.

### SAVE WITH EASTERN

Dress your wheels accurately with long lasting diamonds. Specify holder or nib required. No extra charge.

Carat	Price Complete
1/4	\$ 4.50
1/2	7.50
3/4	10.40
1	14.80
1 1/2	19.50
2	24.00
3	29.00
4	52.50

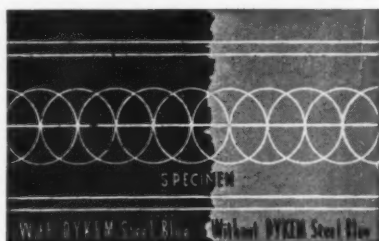
Send for Free Catalog 128 pages



**EASTERN**

**TOOL SUPPLY CO.**  
174 Grand St., N. Y., N.Y.





## DYKEM STEEL BLUE STOPS LOSSES making dies & templates

Simply brush on, right at the bench; ready for the layout in a few minutes. The dark blue background makes the scribed layout lines show up in sharp relief, and at the same time prevents metal glare. Increases efficiency and accuracy.

Write for full information.

**THE DYKEM COMPANY**  
2301 G North 11th St., St. Louis, Mo.

**MORE  
FOR YOUR  
SCRAP**

**DURANT  
SCRAP CHOPPER**

LOW FIRST Cost  
PAY FOR ITSELF



Electric plug installation  
Economical operation  
Fits Any Power press

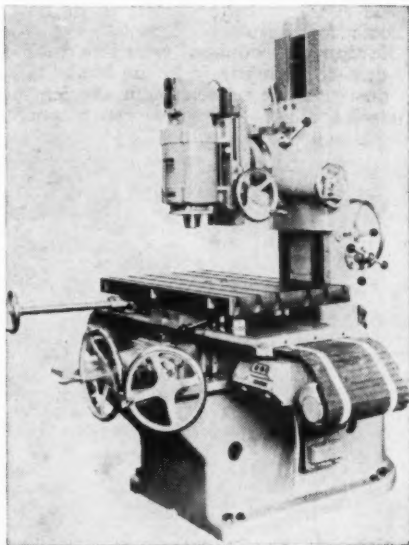
Write for free catalog sheet

**DURANT TOOL SUPPLY CO.**  
155 ORANGE ST., PROVIDENCE 3, R. I.

## High-speed vertical miller

A new, universal, high-speed, vertical milling machine, embodying many novel features, made by Bohnert & Koehle in the U. S. zone of Germany, is now being offered in this country by Kurt Orban Co., Inc., 21 West St., New York 6, N.Y.

Two models are available for pattern making and efficient metal working in general. The Model SF1 has manual control for work table movement and adjustment of the power bracket, while model B3 SF1 is equipped with infinitely variable automatic feed.

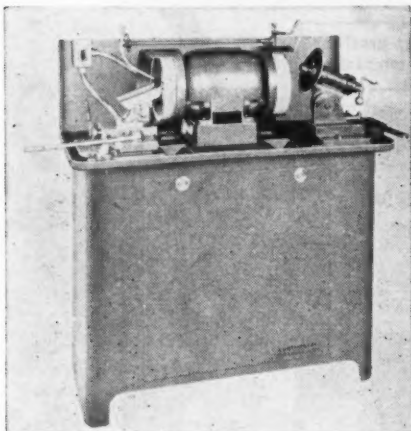


A rotary work table for circular milling is available. A special reversible motor serves as a milling head and provides three speeds. All controls are conveniently placed. Various attachments increase the useful scope of this precision machine tool.

This machine may also be used for polishing and grinding, wood milling by means of rotary chain cutter, and accurate planing of large surfaces with single-lipped cutting tools. Recesses, grooves, dovetails and all imaginary contours can be generated accurately, economically and speedily on this machine.

### Continental chaser and cut-off wheel grinder

This new combination Chaser and Cut-Off Wheel Grinder introduced by Continental Machine Co., 1954 N. Maud Ave., Chicago 14, Ill., will keep cut-off blades and chasers sharp and ready for



immediate use. It avoids the delays and eliminates the expense of relying on outside sources.

The left hand side of the machine is designed to sharpen chasers for thread-

ing up to 8-inch pipe. Pipe and Tube Cut-Off blades are sharpened on the right hand side of the machine. It lengthens life of chasers, permitting repeated sharpenings down to within  $\frac{1}{2}$ " of the end of the chasers.

It converts dull cut-off blades into real production-boosting tools in a matter of minutes. The mechanism is adjustable for any angle of bevel and true diameter of blade is retained even after repeated sharpenings.

According to the manufacturer, the machine was designed at the request of customers. It is powered by a  $1\frac{1}{2}$  h.p. totally enclosed, 220/440 volt, 3 phase motor. The unit is completely equipped with a manually operated starting switch, and a 12-gallon capacity coolant system to prevent overheating of tools.

### STEEL QUIZ

Answers to quiz on page 125.

1. Reduces stress
2. Rapid
3. Below
4. Blowing into
5. Gas bubbles
6. Near melting point
7. Does not require
8. Closed
9. Is
10. Semi-finished

## THE "MIGHTY MIDGET" LINE

ORDER DIRECT on 10 day Money Back Guarantee

### MIGHTY MIDGET RADIUS DRESSER

7" Size

\$41.00 with Diamond



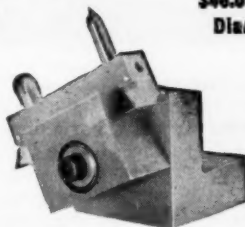
Harden Shaft. Bearing Adjustable for Wear. Accurate. Adjustable 180° Steps. Diamond always Clamped Perfectly in Center.

18" Wheel Size for Norton DeAll  
\$46.00 with Diamond

Special 14" Size \$39.00 less Diamond

### MIGHTY MIDGET ANGLE DRESSER

\$46.00 with  
Diamond



First low cost high precision Angle Dresser on the market. Can be set very accurately with a protractor. Works underneath the wheel. Large bearing surfaces.

Ball Thrust Bearing. Heat Treated Cast Iron. Guaranteed Accurate.

Please give DD number when possible.

**SPERMAN METAL SPECIALTIES • 2199 E. 21st ST., BROOKLYN 29, N. Y.**

**PRATT &  
WHITNEY**

**diaform**  
WHEEL FORMING  
ATTACHMENT

is an inexpensive, portable, precision tool. By following a simple template...

It DIAFORMS  
and re-forms  
the contours of  
Grinding Wheels

— to an ac-  
curacy of .0005"  
— in a matter of  
minutes!

Just set it up  
on a Toolroom  
Surface  
Grinder

**PRATT &  
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Division Miller-Bomard-Pond Company  
WEST HARTFORD, CONNECTICUT



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Export Dept., West Hartford, Conn.

### **Ferro Case hardening compound**

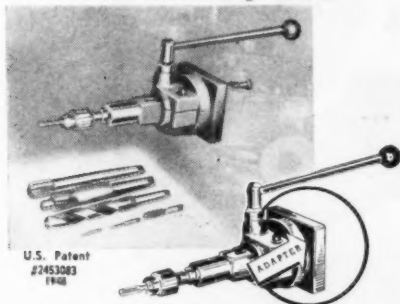
A superior type of case hardening compound is the Ferro Case Grade "S" manufactured by C. G. Buchanan Chemical Co., Baker Ave., Norwood (Cincinnati), Ohio. The outstanding feature of this useful product is its non-poisonous nature. It is manufactured with a melting point that makes it pasty, thus it sticks tight to the work without the disadvantage of melting and running off, as does cyanide. The

Ferro Case Grade "S" is simply sprinkled upon the red hot steel; there is no loss in waste, as every ounce of the compound produces useful results. The material gives a deep, even case, according to its manufacturers, and has no "just as good" substitutes.

### **New lubricant in pencil form**

A new scientific lubricant, useful in the home, shop, office and factory is announced by the Reardon Products, 2109 S. Adams St., Peoria 2, Ill. The new product is called, "Pensilube." It

tool breakage  
**Stop** and  
material spoilage  
caused by drag and jerkiness  
on turrets and large lathes



#### TAPPING

Now, with the Sensitive Turret Attachment, you can cut fine threads from 10/32 to 4" threads with a feel that will allow you to engage without jamming and back off without stripping. More than pays for itself by saving taps and material. One user, who formerly had up to 90% rejects, now reports 100% threads on bronze with a .519-27th tap — same operator using the same late #5 turret.

#### CENTERING

Sensitive feel eliminates breakage of center tools.

#### DRILLING

Sensitive feel for small drills. Powerful leverage for larger drills.

#### REAMING

Reamers cut properly leaving smooth bore.

#### CONSTRUCTION FEATURES

4-point bearing and large surface of square ram reduces friction . . . maximum heavy area cuts effects of torque — feel is same on large or small tools . . . cylindrical ram for adapting special tools and dies . . . #4 Morse taper hole with drift pin and shear pin holes . . . adjustable depth control.

#### FIVE SIZES

Direct mounting for most turrets — adapters for others. Models for lathes.

Write today for catalog and prices —  
give make of machine.

**Williams & Hussey**  
**MACHINE CORP.**  
**Milford • New Hampshire**

June, 1951



**Allison**  
**COLLET CHUCK**



**NO STOPPING  
NO KEYS  
NO WRENCHES  
NO PRODUCTION  
DELAYS**

Meet sudden demands for high speed production by having every lathe equipped with the Allison Collet Chuck. Gives full spindle bore capacity to any lathe having 1½"-8 thread spindles. Requires no keys, wrenches, reverse switching or stopping. Operator simply draws lever ball toward him to tighten collet; pushes it away from him to release. Mail the coupon for complete, illustrated description and prices.

ALLISON CHUCK PRODUCTS  
738 20th Street  
San Pedro, California

Please send catalog page, prices and name of nearest supply house.

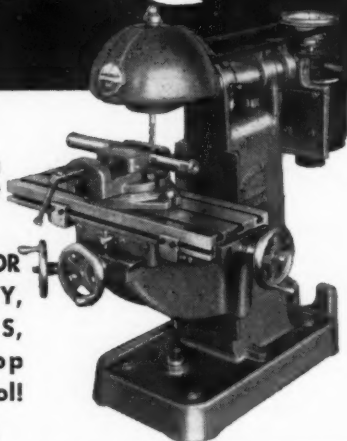
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**HOGGING CUTS  
or PRECISION WORK!  
LOW-COST MILL DOES BOTH!**

Rigid construction  
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performance.

MILLS VERTICALLY OR  
HORIZONTALLY,  
DRILLS, GRINDS,  
TURNS. Every shop  
needs this 5-in-1 tool!

Write for FREE literature.



**benchmaster** PUNCH PRESSES  
AND MILLERS

2952 West Pico Boulevard, Los Angeles 6, California

is compounded by long laboratory processes, and is applied like a pencil to parts to be lubricated.

The "Pensilube" is said to be made of "clean" powder lubricants, (not graphite) and molded with two highly developed waxes. It is silver in color and will not soil the hands or clothes. It is asserted that "Pensilube" has been rightly endorsed for use on zippers and makes them work like new. It has also been tested on more than 100 other uses, including file cabinets, drawers,

bolts, locks and keys, moving machine parts, door latches, etc.

#### **Inhibitor for non-aqueous liquids**

Development of an inhibitor to protect shellac and other non-aqueous liquids from metal contamination is announced by Monsanto Chemical Company's Merrimac Division, Everett, Mass.

The new product, known as Inhibitor 038, is stated to be particularly valuable in view of National Production

**GET MORE PRODUCTION OUT OF YOUR  
PRESENT POWER PRESS EQUIPMENT**



Write for Illustrated Booklet

with the **V&O**  
**FEED-O-MATIC**  
**POWER PRESS FEEDER**

*Installed on Any Make Press  
for Secondary Die Operations*

- Increases secondary die operation production up to 50% — 100%, and higher, with safety!
- Makes operator's job easier . . . safer.
- Increases die life.
- Requires no special dies.
- Can be set-up for new work in 1-hour, or less.

**THE V&O PRESS COMPANY**  
DIVISION OF EMHART MANUFACTURING COMPANY  
Builders of Precision  
POWER PRESSES and FEEDS  
Since 1889 **HUDSON, N.Y.**

Authority restrictions on shellac containers.

The new inhibitor prevents iron pick-up, by forming a thin coating of a complex iron phosphate on the inner wall of the container.

Inhibitor 038 was developed during the past year and a half in collaboration with Merrimac customers. Research and development technicians directed their attention to a product that could be mixed in small amounts with shellac to reduce or prevent its tendency to attach the iron in the container.

A 40 % alcohol solution of an organic phosphate was found to give best results in low concentrations. Twelve-month shelf aging tests demonstrated that Inhibitor 038 could be of service to shellac cutters whose products normally require packaging in heavy terne coated cans.

The tests indicated that .5 to 1.0% of Inhibitor 038 in eight-pound terne-coated containers provided satisfactory protection from iron contamination for a minimum shelf life of one year.



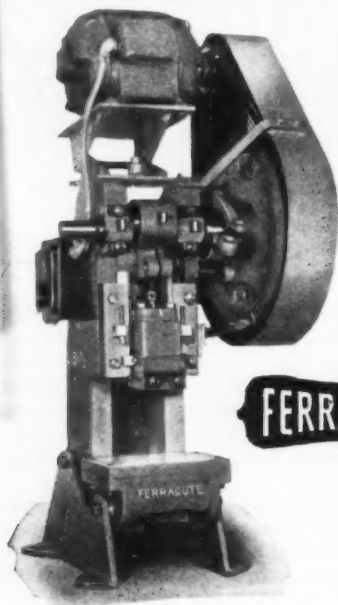
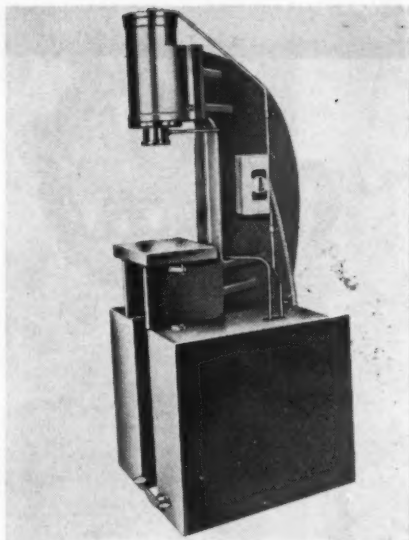
### 20 ton hydraulic press

Ross & Company, 1401 East 57th St., Chicago 37, Ill., introduces a new motor driven hydraulic press for assembling, broaching, crimping, drawing, forming, laminating, riveting and general forcing operations. This press is double acting and has 8" of throat, with 12" ram travel. The clearance under the retracted ram is 16". The ram speed is 60" per minute down and 90" per minute up, under full load. The ram is controlled by a foot pedal and is activated by a vane type pump set to operate at 1250 pounds per square inch.

The entire press is of steel welded construction except for the cylinder, which is a Meehanite metal casting. The power unit is contained in the base making a compact and portable unit occupying 28" by 34" of floor space.

### Steady rest for big jobs

A new steady rest for mounting extra large work in the lathe is announced by the South Bend Lathe Works, South Bend 22, Ind. Now available for the 16"



### IN STOCK - LIMITED NUMBER FOR IMMEDIATE DELIVERY!

Ferracute heavy-duty Bench Presses - No. C-31½. 6 tons capacity. 1¼" stroke, 6½" die space, 3¾" throat, 4⅞" x 3¾" ram area, 7" x 11" bolster area. Catalog speed, 170 to 190 strokes per minute. Press capable of higher speeds on continuous operation—built with the same precision and fine quality of workmanship that goes into more costly presses.

**FERRACUTE**

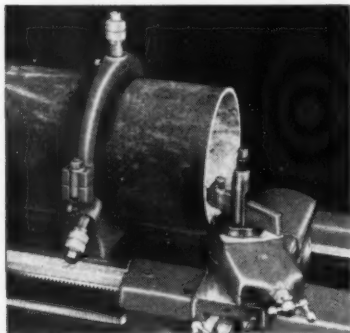
WIRE YOUR INQUIRY AT ONCE -  
THEY WON'T LAST LONG TODAY!

**FERRACUTE MACHINE COMPANY**

Bridgeton, N. J., U.S.A.

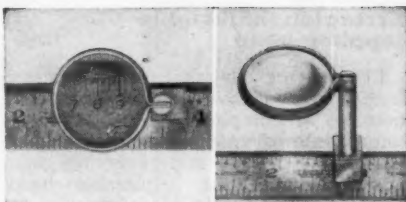
and 16-24" South Bend Lathes, this steady rest takes work between  $4\frac{3}{4}$ " and  $10\frac{3}{4}$ " in diameter. It is said to be especially suited for machining pipe, pressure cylinders, pump and engine cylinders, and similar large diameter work that is not excessively heavy.

This large capacity steady rest incorporates the improved compound thread jaw actuating mechanism which has proved to be superior to former designs. This construction saves much time as it provides quick and easy wrenchless adjustment and locking for



Patent Pending

the jaws. Each jaw is moved in or out by turning a large knurled knob and is locked in the required position by a thumb screw. A double acting compound screw thread provides approximately  $3/16$ " of jaw movement for each



#### MAGNET MOUNTED MAGNIFIER

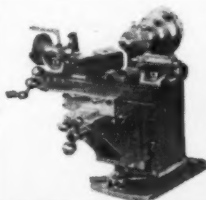
A powerful magnifier mounted on a sturdy supporting post to which is attached a high strength Alnico magnet. Will remain firmly attached to any iron or steel surface leaving both hands free. Note from the above photograph how it brings out the 100ths scale on the machinists' rule. The height is already set for maximum magnification without distortion. May be used for reading any gauge or scale, helpful in precision layout work, excellent for grinding small drills, or may be used for close examination of any small parts. Thousands already in use all over the U. S. May be ordered direct for immediate shipment. Price \$1.50 postpaid. Dealer inquiries invited.

#### THE MILLER COMPANY

Waseca, Minn.

revolution of the adjusting knob. Smooth action, with just enough holding resistance, permits each jaw to be quickly and accurately adjusted to the work.

The steady rest top is hinged for easy mounting and removing of the work. The brass jaws move in precision steel sleeves pressed into the supporting frame. All parts are held to close tolerances in manufacture so that replacement is simplified in event of loss or damage.



#### Build Your Own Machines! Are Machine Deliveries Hurting You?

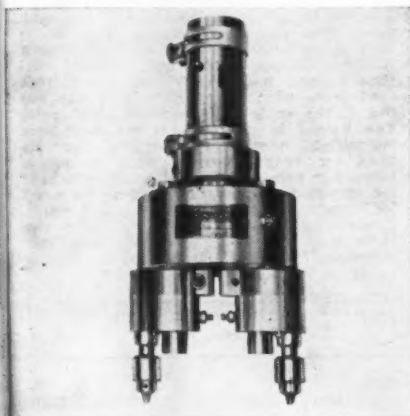
With your facilities of a small shop you can build needed machines with their related accessories from our castings sets. Save up to 80% on comparable new machines. Send \$1.00 for either portfolio No. 1 containing complete construction drawings of 8" screw cutting lathe, 7" bench lathe and 6" crank shaper, or portfolio No. 2 containing complete construction drawings of 3 milling machines with up to 8" table travel.



**THE POOTATUCK CORP.** 102 Sammis Place, Stratford, Conn.

### Errington adjustable tapping head

Errington Mechanical Laboratory, Inc., Staten Island 4, New York, announces a completely new self-contained auto reverse Adjustable Tapping Head. The driving and reversing gears are built into the adjustable head, thereby constituting a much shorter and more compact device.



This head is completely sealed in a cast aluminum case with alemite fittings for pressure lubrication. All bearings are either hard bronze, ball or needle. Gears and spindles are one piece, turned from bar stock and all are heat treated for long wear.

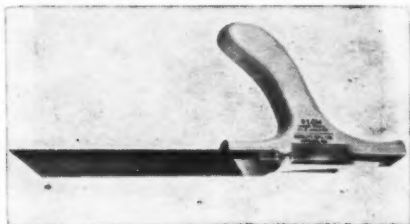
At present, these heads are made in two sizes, with  $\frac{1}{4}$  and  $\frac{1}{2}$ " tap capacity in 2, 3, 4, and 6 spindles equally spaced on circles.

### File holder facilitates tool control

The Remont Manufacturing Co., Lombard, Ill., has developed a new type of file holder offering safety, advantages as well as practical control of a file in all its applications in industry. It is called the "Over-Tang" File Holder.

The tool provides a comfortable wooden grip, positioned above the file when attached, so that the cutting surface of the file will be unobstructed throughout its entire length including the tang, and it permits the filing of unlimited comparatively flat surfaces. The position of the handle also offers better control of the file for all filing.

The handle is made of wood to absorb moisture, and to avoid its becoming slippery, and also because wood does not absorb and retain extreme heat or extreme cold. The handle is reinforced with a steel shaft to prevent breakage. The file is attached to the

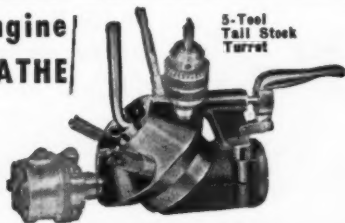


handle by a steel V-block set in the handle itself, designed so that the file is driven on, and held so securely it must be knocked off. The tang is covered by the handle for safety.

## PRESTO! Your Bench or Engine Lathe BECOMES A TURRET LATHE

Several sizes for converting up to 24" swing. For turning, roughing, boring, drilling, tapping, finishing, etc. without stopping lathe or changing tools.

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LATHE USE . . .**

# TAP BREAKAGE



**Reduced**

The Dahlstrom Tap Guide stops tap breakage—  
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For machine tapping, the spindle top is center-bored to  
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for hard-to-get-at-places.

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Guide to big work—rather than carrying the work to the  
Tap Guide. Plants with several Guides in use fasten them  
to posts or benches spotted throughout the tool room.

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**DAHLSTROM MANUFACTURING CO.**  
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*Dahlstrom* **TAP GUIDE**



**\$59.50  
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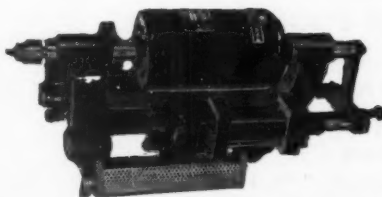
**TAP  
WRENCH**

**\$3**



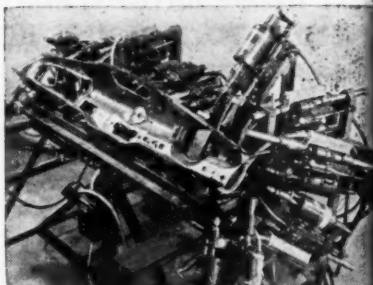
For the occasion-  
al tapping job.  
Fits all Dahl-  
strom tap adapt-  
ers.

## How to Simplify Production-Precision Drilling of Holes From .004" to .156" Diameter



### USE THESE COMPACT DRILL UNITS FOR SIMPLE OR COMPLICATED SET-UPS

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spindle provides speeds from 1000 to 10,000  
or 2,500 to 15,000 RPM.



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miscellaneous holes in automobile dash board.

**AVAILABLE WITH AIR OR  
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SPINDLE SPEEDS**

Illustrated is the 8" model with air feed and  
hydraulic control.

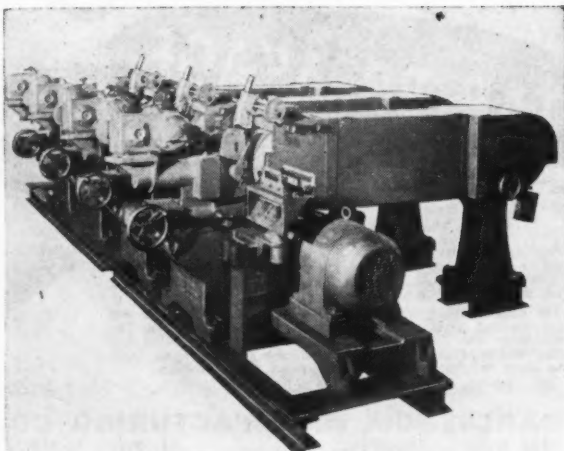
**THE ELECTRO-MECHANO CO.**  
263 EAST ERIE STREET  
MILWAUKEE 2, WISCONSIN

*Write for Bulletin BB-650.*

## High speed centerless polishing machine

Production Machine Company, Greenfield, Mass., has introduced its Type 101 High Speed Centerless Polishing Machine. A tandem installation of these machines was recently demonstrated on welded steel tubing at 70 lineal feet per minute. Such speeds for polishing cylindrical work were heretofore considered unlikely, yet these machines are stated to be able to produce nearly any desired finish, if a sufficient number of units are used in the installation.

While maintaining the same general design as the standard speed machine, this high speed model has a completely new work feeding unit and motorized variable speed feed drive assembly. Simple adjustments within



easy reach of the operator permit a range of feeding speeds upward of the 70 f.p.m. as stated above. The changes

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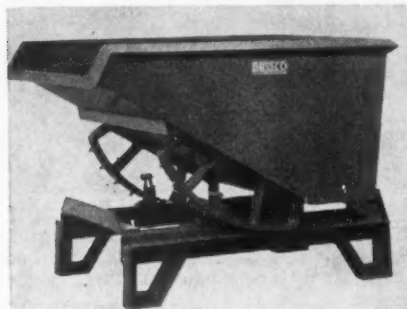
in design included a larger wheel spindle, with capacity for contact wheel or buffs up to 6" wide.

Because of the high speed of operation, and the fact that most tube polishing operations require several passes, these machines are usually installed in tandems of from two to six units. The illustration shows a typical installation of four machines, the first three equipped with idler backstands, and the fourth arranged to use a buff for final operation. Adjustable roller fixtures are provided to support the work as it automatically passes from one machine through to final buffing operation.

Specifications include a spindle speed of 2088 r.p.m. Recommended motor is a 10 h.p., 1800 r.p.m. The variable speed drive to the feed unit has an infinite speed range of from 98 to 279 r.p.m. The range of work feeds is from 0 to 100 lineal feet per min. Polishing wheel may be from 10" to 16" in dia., with a maximum face of 6"; spindle hole is 1 3/4". The floor space occupied by the machine is 45 1/2" x 53 1/2"; overall height is 45 1/2"; the height from the floor to work center is 33".

### Scrap handling hopper

The new Brusco Automatic Self-Dumping Hopper is now in production by the Brummeler Steel Products Co., 1415 Ionia Ave., S.W., Grand Rapids, Mich. The new automatic hopper



speeds scrap handling and disposal in foundries, machine shops and metal working plants. The hopper is placed adjacent to the work area. A fork or pallet lift truck moves the entire unit (hopper and skid) to the dumping area



Test prove that Star Molyflex Blades cut 23.8% more metal than the average of eight other leading high speed blades tested! That means they're extra tough—and that they cut clean and easy, too. Molyflex high speed steel blades are completely shatter-proof—completely unbreakable in a frame. They're available in a complete range of sizes and pitches. They're made to handle your roughest, toughest metal-cutting jobs.

### STEELRITE METAL-MARKING CRAYONS

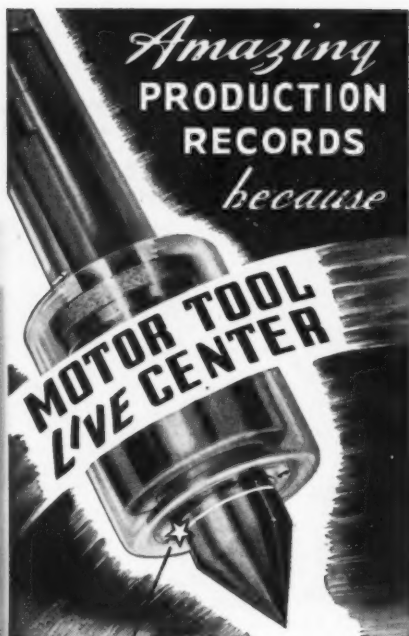
These extruded soapstone crayons can be used on hot, cold, damp or grimy metals. Markings withstand pickling—will not affect enamel applications. A complete range of sizes and shapes.

Ask your distributor for free copies of the STAR Wall Chart and STAR Metal-Cutting Booklet. They'll show you how to get maximum cutting results from hand, band and power blades.

The STAR Line is complete—there's a STAR Blade that's right for every cutting job a hack saw or band saw can handle.







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You no longer have to guess whether you are overloading your live center thrust bearings if you use **MOTOR TOOL LIVE CENTERS**. When the load is too great the **RED BAND** around the spindle disappears into the housing. You can see at a glance when overloading occurs. This is an exclusive feature, developed by Motor Tool which cuts repair costs to practically nothing if due diligence is exercised. As long as the **RED BAND** is visible you are running **COOL** and **SAFE**.

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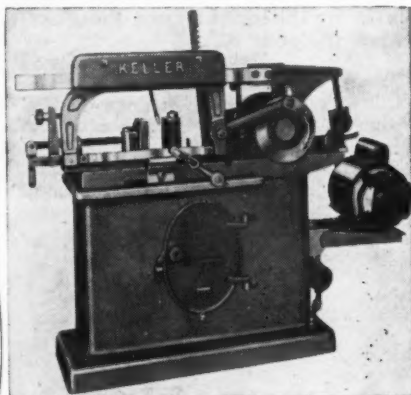
Make the Rule  
to Call Motor Tool

when it is filled. A feature of the Brusco Hopper is an easy-to-operate release which can be tripped from the lift truck to facilitate handling and save time. The hopper is constructed so that the center of the load is located over the rocker. When the release is tripped the forward weight of the load automatically dumps the hopper. The empty hopper also returns to normal position automatically.

Capacities of the new Brusco Hoppers range from  $\frac{1}{2}$  to 2 cubic yards. Dimensions vary from 26" x 44" x 24" to 51" x 71 $\frac{1}{2}$ " x 39". Special sizes and capacities will be made to order. The hopper is fabricated from 3/16" reinforced steel plate. The skid is fabricated entirely of heavy angle steel for exceptionally heavy duty.

**Heavy duty power hack saw**

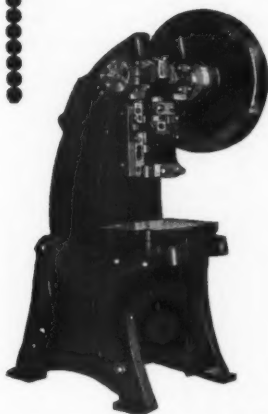
A new heavy duty power hack saw has added to the Keller line, according to a recent announcement by Sales Service Machine Tool Company, 23 University Ave., St. Paul 4, Minn.



The new model, known as No. 3CH, has a 6" stroke, a built-in coolant tank in base, Oilite bearings and is furnished with a  $\frac{1}{2}$  h.p. single or three-phase motor as standard equipment. The saw will handle materials up to 6 $\frac{3}{4}$ " x 6 $\frac{3}{4}$ ". It is equipped with swivel vise, automatic feed system, and an automatic stop. It takes either 12" or 14" blades. Two speeds are provided, 70 or 125 strokes per minute.

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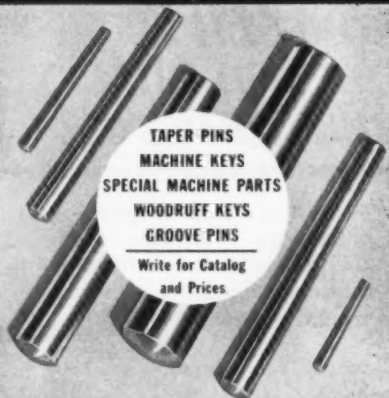
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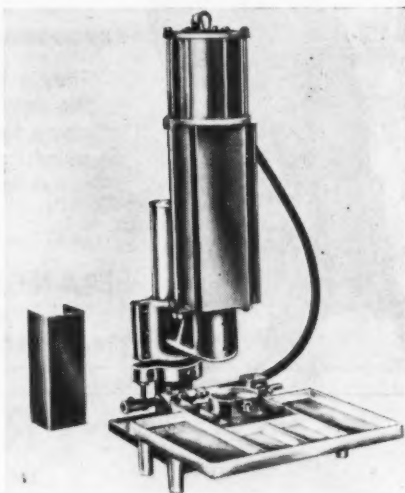
**KARL A. NEISE**

Dept. B.B.

381 Fourth Ave., New York 16, N.Y.

### Semi-automatic staking press

An improved air-powered bench-type press for light staking, forming, riveting, punching and similar operations, is announced by Winter Products, Inc., Box 3112, Bridgeport, Conn. This Model RR-6A press is a useful replacement for "foot" or "kick" presses, where safety plus high operating speed are required without the fatigue characteristic of the



older type of equipment. This press can optionally deliver as many as 60 spring-powered blows per minute with variable impacts up to 12,000 lbs., or an adjustable air-powered squeeze up to 12 times the air-line pressure. The precise control of stroke and impact make it suitable for even delicate marking operations, since there is no rebound to mar the work.

The 10" x 4½" throat accepts large work, and the stroke is adjustable from 1" to 2". Two-hand controls assure safety with manual feed while use of the accessory air-operated slide feed permits foot operation up to 75 or more per minute with perfect safety. Designed for bench mounting, the unit has an 8" x 10" base, stands 30" high overall, and weighs 72 lbs.

The Model 200 slide feed, an air-operated accessory, features also auto-

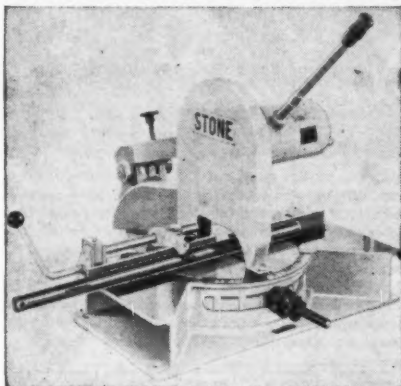
matic air-ejection of the finished parts. Its overall size is 8" x 9" x 2 $\frac{3}{8}$ "; its work table 3 $\frac{1}{2}$ " x 4", and stroke is 2". Also available is a small-parts tray 13" wide by 10" deep, for use with or without the slide feed, fitting on the base of the press and helping to speed up work by keeping materials readily available.

#### Stone metal cut-off machine

A new metal cut-off machine has recently been introduced by Stone Machinery Co., Inc., 638 Fayette St., Manlius, N. Y.

The new Model M-14 performs low-cost cutting of ferrous and non-ferrous metals at the rate of 4 seconds p.s.i. The capacity of this new unit is 1 $\frac{1}{2}$ " solids, 2 $\frac{1}{2}$ " pipe and structurals, and miscellaneous cutting of 2" solids (15 seconds). A semi-high speed saw blade is recommended for the cutting of non-ferrous solids up to 1", and light wall tubing, structurals, and extrusions up to 2 $\frac{1}{2}$ ".

Engineered with positive drive without the use of belts (an exclusive Stone feature), the Model M-14 full 3 $\frac{1}{2}$  h.p. geared-in-head motor is stated to deliver maximum constant power, thereby



increasing cutting speed, affording greatest efficiency, and insuring longer wheel life.

Designed for ease of operation, flexibility and safety, the M-14 swivels up to 45° in either direction, and requires a minimum bench space of only 34" x 32".

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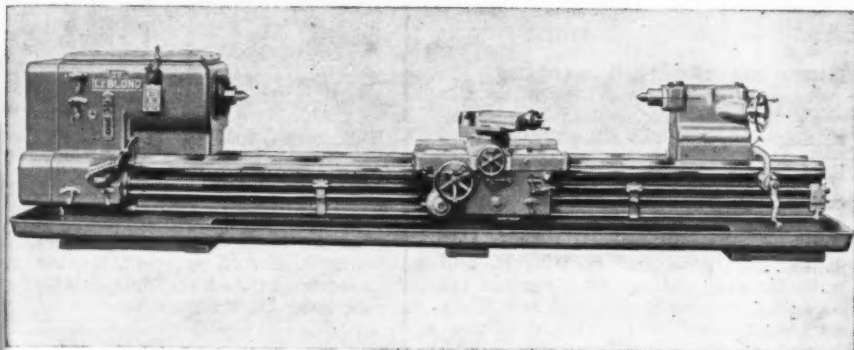
**NIELSEN, INC. LAWTON,  
MICH.**



### LeBlond 32" engine lathe

Four-directional power rapid traverse, standard equipment on the new 32" Heavy Duty Engine Lathe, manufactured by The R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio, makes possible fast and convenient traversing

profiling. Other features include a 34½" swing, 32 spindle speeds from 4 to 500 r.p.m., totally-enclosed quick-change box, hardened and ground replaceable steel bed ways and automatic lubrication through headstock, quick-change box and apron.



of carriage and cross-slide, each in two directions. It may be equipped for hydraulic (Hydra-Trace) or mechanical

The headstock incorporates the free-running principle with hardened and ground steel gears; only the gears ac-

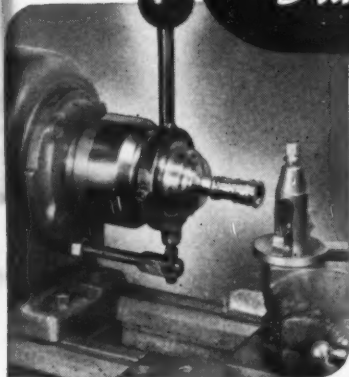
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# DAVOS

## Draw Collet Chuck

...ALL WAYS!



Illustrated is an actual lathe installation of the new Davos Collet Chuck maintaining a .001 tolerance in boring and turning. The Davos Collet Chuck utilizes helix shape spindle bore.  
Courtesy of S. & G. Engineering Co. Chicago, Illinois

Your production problems are over. Time and money lost on old jigs for second operation equipment is no more. Slow-ups and maintenance are cut to zero and all with greater accuracy. Yes, all this and more are yours with the new Davos Draw Collet Chuck. Super fast lever action permits continuous use without stopping to load and unload bar stock while in operation. Adaptable to all lathes, drill presses, milling machines, and grinders, the Davos uses standard round, square, hex and plain-serrated type draw collets. Proven superior by actual use to all other collet chucks, the Davos is truly a fine precision instrument.

Size No.	Standard Draw Collets	Capacities Inclusive	Body Diameter	Overall Length	Approximate Weight
113	3C"	1/64" to 1/2"	2 1/2"	3C - 2 1/2"	2 lbs.
114	4C"	1/64" to 1/2"	2 1/2"	4C - 3"	3 1/2 lbs.
115	5C"	1/64" to 1"	3 1/2"	5C - 3 1/2"	4 1/2 lbs.
116	7 1/2"	1/32" to 1 1/2"	4 1/2"	7 1/2 - 3 1/2"	6 1/2 lbs.
117	3J"	1/32" to 1 1/2"	4 1/2"	3J - 3 1/2"	6 1/2 lbs.

COMPLETE INFORMATION AND PRICES UPON REQUEST. DEALERS INQUIRIES INVITED.

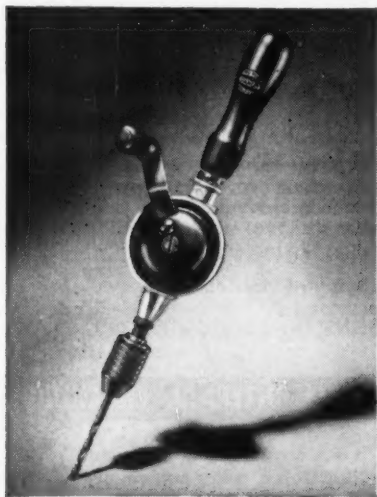


**Stallion MANUFACTURING CO.**  
2017 N. HALSTED ST. CHICAGO 14

tually needed are in mesh at a given speed, the remainder running free. No-load friction horsepower is thus minimized, leaving maximum power available for removing metal. The machine is arranged for 25, 30 or 40 h.p. motor, at 1200 r.p.m. Forty-eight feeds and threads may be selected; feeds from .004" to .250"; threads from  $\frac{3}{4}$  to 46.

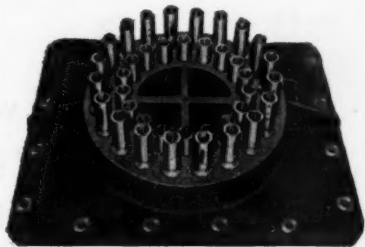
#### Stanley develops new hand drill

Stanley Tools, Division of the Stanley Works, New Britain, Conn., announces their new "100 Plus" No. 610 Hand Drill. This new streamlined drill bores larger holes more easily to full  $\frac{1}{4}$ " capacity in hardwood or metal. The smoother action is the result of a higher spindle torque. The drill is equipped with solid cast iron speed gear and two steel pinions with machine-cut teeth; ball bearings on the spindle carry the drilling pressure. Gears are totally enclosed and protected from dust by light weight aluminum housing which also keeps hands and clothing from catching.



Drill is mischief-proof with all parts locked in place—no parts to lose, no pinched fingers.

The protected jaw spring chuck affords positive jaw action through concealed springs that hook into the jaws of the new  $\frac{1}{4}$ " chuck.



*Pictured: a 38-Spindle Heavy-Duty Drill Head*

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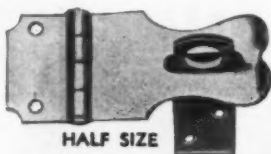
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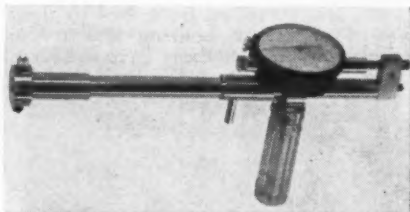
### Rimat internal thread comparator

Rimat Machine Tool Co., 1117 Air Way, Glendale 1, Calif., has recently developed an Internal Thread Comparator. This instrument measures from the pitch line of any one thread in a nut to the pitch line of the two threads lying diametrically opposite it. When set to a basic ring gage, the Rimat Comparator gives plus or minus deviations from the basic pitch. The indicator reading is in tens of thousandths, and for any one setting, the instrument has a range of plus or minus .003".

The device is portable, so may be used with equal facility at the machine or at the bench. Operator skill required in its use is at a minimum, and threads in deep holes can be measured as readily as those located near the mouth of an opening.

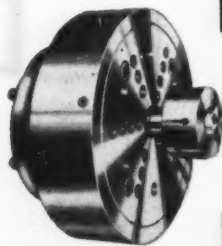
The instrument may be set to a ring gage in a few seconds. This setting automatically compensates for any wear

of the comparator gage members which touch the work piece. Therefore, unlike plus gages, the instrument need not be replaced or reconditioned frequently in order to maintain its original accuracy. The device may be used for checking threads of all classes of fit.



The comparator does not depend for its accurate operation upon any degree of concentricity between the pitch diameter being measured and any related outside diameter.

Standard models are available for measuring NC threads  $\frac{1}{2}$ "-13 to 4"-4, and NF threads from  $\frac{1}{2}$ "-20 to  $1\frac{1}{2}$ "-12.



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Here's the answer to fast, accurate and economical machining. SPEEDGRIP CHUCKS are being used in ever increasing quantities in plants everywhere. Write today for information on how SPEEDGRIP can speed your second operation work. Layouts will be made and prices quoted from blueprints. No obligation.

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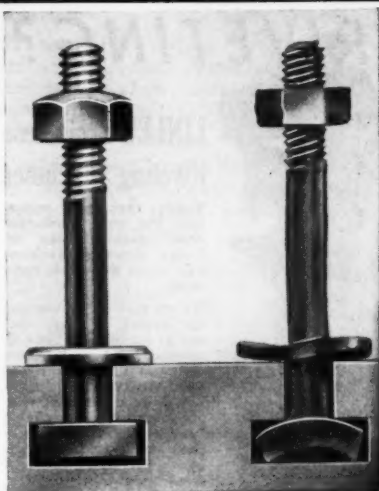
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Every mechanic knows the damage done to the accuracy of costly machine tools by using soft, poorly made or distorted bolts on T-Slots of machine beds.

Boyar-Schultz SMB Bolts are made from upset forgings of alloy steel, heat treated for maximum properties. They are precision machined with heads at right angle to body, presenting a flat bearing surface to T-Slots. For best results use SMB Nuts and Washers with SMB Bolts.



SMB Bolt on left fits the T-Slot. Poorly made bolts of soft materials break down the machined surfaces, destroying accuracy.

**BOYAR-SCHULTZ CORPORATION, 2108 Walnut Street, Chicago 12, Illinois**

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**For Tool, Die, Pattern or Template layout on metal . . . Quick identification of bar stock, sheet, strips or parts . . . Shows up in sharp relief—dries instantly . . . Write for sample and circular on company letterhead.**

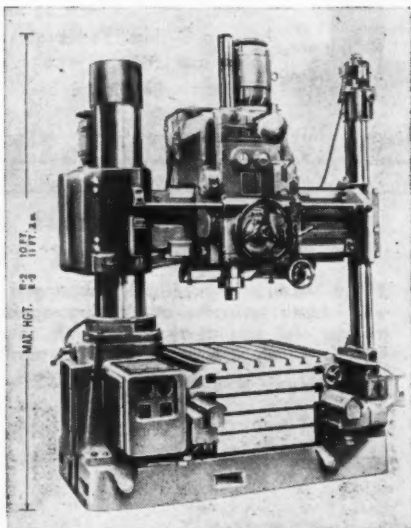
**MICHIGAN CHROME &  
CHEMICAL COMPANY**

6340 E. Jefferson Ave. • Detroit 7, Mich.

## Oerlikon production jig borers

**The Cosa Corporation, 405 Lexington Ave., New York 17, N. Y., is introducing in the United States the Oerlikon Production Jig Boreers—Types R-2 and R-3—for precision and production boring, drilling, reaming, tapping, screw cutting, facing and outside turning without jigs. These machines are manufactured by the Oerlikon Machine Tool Works, Zurich, Switzerland.**

These double column machines are designed so that the boring head, cross rail and smaller column can be locked rigidly in any position. The rigid frame thus created makes it possible to locate holes by the coordinate method, using gauge blocks or pins, to a tolerance of .0004" to .0008" between centers and to drill holes as small as .040" in diameter.



Both models have 18 spindle speeds and 12 feeds. The R-2 has speeds from 38 to 1900 r.p.m. and feeds from .0012" to .031" per revolution; the R-3 has speeds from 30 to 1500 r.p.m. and feeds from .0012" to .0472" per revolution. The motor on the boring head of the Model R-2 is 6 h.p.; that of the Model R-3 is 7.5 h.p.

Additional design features include: a fast mechanical return of spindle, in

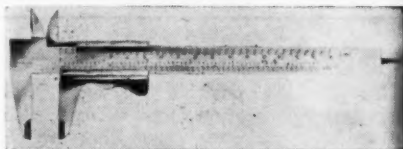
addition to hand operation; an automatic feed for setting depth of holes up to  $14\frac{1}{2}$ " ; a tool-ejector bar inside the boring spindle; graduated precision scales with vernier readings to .0008" on ways of boring slide and work table. All operating controls are conveniently located on the boring head.

The Model R-2 has a clearance between columns of  $58\frac{3}{4}$ " ; the maximum distance between spindle and work table is  $27\frac{9}{16}$ " , between the spindle and base plate it is 48" ; the horizontal travel of the boring head on cross rail is  $25-19\frac{3}{32}$ " ; the travel of work table is  $39\frac{3}{4}$ " ; the capacity for drilling steel is  $1\frac{1}{4}$ " diameter and for cast iron,  $2\frac{3}{8}$ " . The Model R-3 has clearance between columns of  $65\frac{1}{4}$ " ; maximum distance between spindle and work table is  $39\frac{3}{4}$ " , between the spindle and base plate is  $59\frac{3}{4}$ " ; the horizontal travel of the boring head on the cross rail is  $28\frac{3}{4}$ " ; the travel of work table is  $47\frac{1}{4}$ " ; capacity for drilling in steel is  $2-11\frac{1}{64}$ " diameter, and for cast iron,  $2\frac{3}{4}$ " .

### E-K 1-/1000" vernier calipers

Transocean Trading Co., 1511 N. Gardner St., Los Angeles 46, Calif., announces a new, accurate German-made Vernier caliper available for immediate delivery.

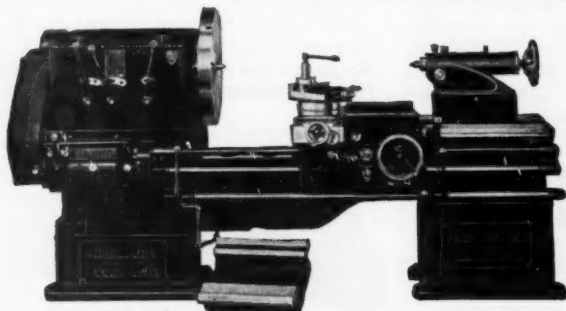
Designed by German precision craftsmen, these E-K calipers are said to be outstanding for quick, handy and accurate measurements.



The precision measuring surfaces are glass-hardened and lapped with easy to read, fine engraved scales of both 1/1000" and 1/10" mm, for inside, outside and depth measurements with a friction lock thumb release.

## NEBEL Removable Block Gap Lathes

furnished in the Geared Head Motor Driven Type, 3 Step Cone Double Back Gear Belt Driven Type or with Motorized Headstock. Especially adapted for repair and maintenance as well as for general manufacturing. Handle a large variety of work with large swing through the gap.



All Geared headstock type completely equipped with Timken Bearings, with motor mounted on rear of lathes. Quick change gear box, compound rest, steady rest, chasing dial, face plate, driver plate, wrenches, tool post and centers.

Furnished in four different sizes as follows: Series "L N" 18/27", Series "A A" 28/36", Series "B" 22/33" and Series "D" 28/40".

Write for Circular Giving Complete Information

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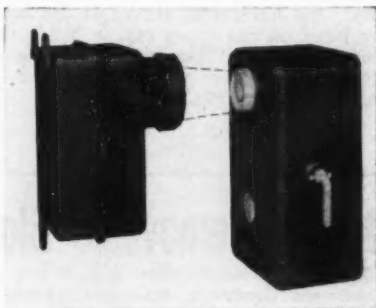
**CENTER TOOL CO. 153 CENTRE STREET, N. Y. 13**

### Photoelectric intrusion alarm

To provide positive intrusion and burglary protection for offices and other industrial properties, Photoswitch Inc., 77 Broadway, Cambridge 42, Mass., offers its Photoelectric Intrusion Alarm Set P1A. This equipment provides a protecting wall of invisible light across any space up to 50 feet. No intruder can enter this space without setting off Photoswitch Intrusion Alarm.

The Intrusion Alarm Set consists of the Photoelectric Control Type A20C-2 and Light Source Type L60B. An invisible infrared beam is projected from the light source, spanning any distance up to 50 feet. This is aligned to strike the "eye" of the control. Momentary interruption of the infrared beam actuates the control relay, which is wired to operate and sustain an external alarm device. The alarm can be silenced only by restoring the electrical circuit to original conditions by use of a manual or automatic reset switch. A

tamper-proof sensitivity adjustment on the control permits positive operation over varying distances between the control and light source, and under all conditions of ambient light.



All equipment is of rugged construction and supplied in dust-tight housings. Emphasis has been placed upon simplified installation and minimum of maintenance.

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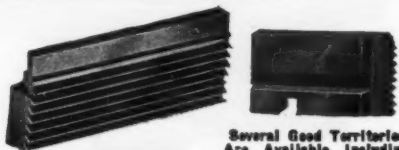
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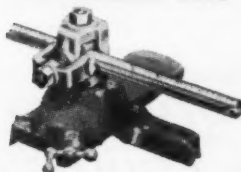
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Permanently graduated in  $\frac{1}{4}$ " calibrations indicating depth of bore. Eliminates necessity for file and chalk marks.

Bar No.	Dia.	Length	Tool Bit	Price
162A	$\frac{1}{8}$ "	7"	$\frac{1}{8}$ "	\$ 3.50
122A	$\frac{1}{8}$ "	8"	$\frac{1}{8}$ "	3.75
123A	$\frac{1}{8}$ "	9"	$\frac{1}{8}$ "	3.85
124A	$\frac{1}{8}$ "	10"	$\frac{1}{8}$ "	3.95
125A	$\frac{1}{8}$ "	11"	$\frac{1}{8}$ "	4.50
126A	$\frac{1}{8}$ "	13"	$\frac{1}{8}$ "	6.50
127A	1"	14"	$\frac{1}{8}$ "	7.50
128A	$1\frac{1}{8}$ "	16"	$\frac{1}{8}$ "	9.75
129A	$1\frac{1}{8}$ "	18"	$\frac{1}{8}$ "	13.75
130A	$1\frac{1}{8}$ "	23"	$\frac{1}{8}$ "	17.75
176A	$1\frac{1}{8}$ "	30"	$\frac{1}{8}$ "	39.50
155A	$2\frac{1}{8}$ "	36"	$\frac{1}{8}$ "	79.50

## Immediate Delivery GLOBE BORING BAR HOLDER SETS



Exclusive dual clamping arrangement permits independent adjustment of bar or alignment of holder—either may be made without disturbing the other. For lathes from 8" to 36" swing.

(Complete with three bars)

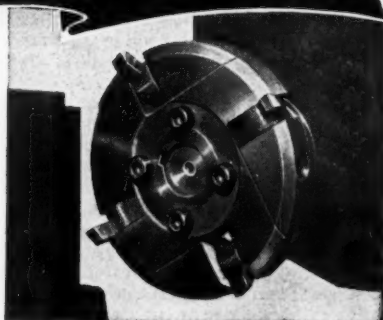
Set No.	Diameter Bar Inches	For Lathe Swing Approx.	Price Comp.
0-AA	$\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{3}{8}$	8" to 12"	\$18.75
1-A	$\frac{1}{8}$ , $\frac{1}{4}$ , $1\frac{1}{8}$	12" to 16"	29.75
2-A	$\frac{1}{8}$ , $\frac{3}{8}$ , $1\frac{1}{8}$	16" to 18"	38.85
3-A	$\frac{1}{8}$ , $1\frac{1}{8}$ , $1\frac{1}{2}$	20" to 22"	68.55
4-A	$\frac{3}{8}$ , $1\frac{1}{8}$ , $1\frac{1}{2}$	24" to 26"	99.75
6-A	$1\frac{1}{8}$ , $1\frac{1}{2}$ , $2\frac{1}{8}$	24" to 36"	212.85

## GLOBE PRODUCTS HEAT SEAL CORPORATION

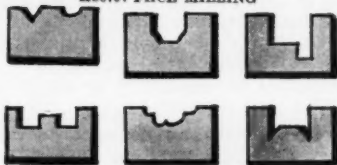
3380 Robertson Blvd.  
Los Angeles 34, Calif.

# NEWFIELD

## UNIVERSAL FLY CUTTER



Above: FACE MILLING



Above—a few of the many cuts that can be made with the Newfield Universal Fly Cutter in ONE operation on a horizontal or vertical mill or drill press. Individual adjustable bit holders permit slots of any shape to be cut  $\frac{3}{16}$ " to 2" wide.

## STANDARD BITS MAKE 4 TO 6 DIFFERENT CUTS IN 1 OPERATION!

For many types of milling, light metals and plastics as well as steel, there is no longer need for special cutters. A single Newfield Universal Fly Cutter, utilizing any type of standard high speed steel or carbide bits, makes multiple cuts in one operation. In contrast with expensive specially ground cutters, the standard bits used in the Newfield are easily and quickly ground in your own shop, readily replaced or reground for other work, at small cost. There is practically no down-time if a bit is broken.

The Newfield fits all standard arbers, turns to any required speed for fly cutting, slotting, surface and straddle milling, gear cutting, disc and gasket cutting. Standard sizes are 4", 6", 8", 10".

Write today for details of this versatile, production-upping, money-saving tool.

## NEWFIELD MACHINED PARTS CO.

210 W. Seventh St. Los Angeles 14, Calif.



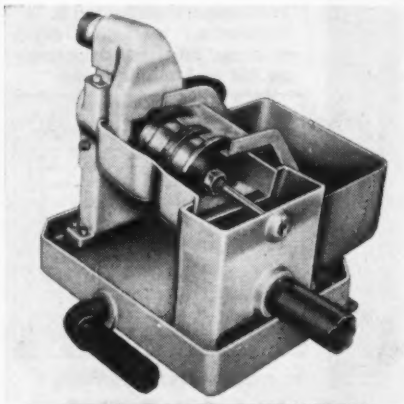
### Clarifier removes contaminants from liquid coolants

The new Houdaille Magnetic Clarifier, introduced by the Honan-Crane Corp., 911 Sixth St., Lebanon, Indiana, removes over 98% of contaminants from liquid coolants and provides continuous delivery of clean coolant to the machine sump for re-use. The unit is designed for application on such machine tools as wet surface grinders, thread grinders, milling machines, etc.

Removal of metallic and abrasive particles is accomplished by use of permanent ring magnets completely enclosed in the revolving non-magnetic cylinder. Circular steel discs, end pieces of the cylinder acting as magnetic poles, seal off the magnet cores to prevent the fluid from coming in contact with magnets. This design provides 360° of constant magnetic attraction.

Turbulent flow of the coolant beneath the cylinder keeps metallic particles in suspension until attracted to metallic poles. Abrasive non-magnetic particles moving along with magnetized contaminants are collected by a non-mag-

netic wiper trough, fitted to the magnetic cylinder. No wear occurs on either surface, as the trough does not rub on cylinder, using instead the accumu-



lation of magnetized particles to wipe the mass of contamination as the cylinder revolves past the trough.

## HIGH SPEED PRODUCTION CONTINUOUS OIL GROOVING

**WICACO CONTINUOUS OIL GROOVER** cuts grooves of all descriptions, internal or external, continuous or intermittent.

Send us samples for grooving. We will return them cut to specifications, with a record of time and cost estimate. No obligation.

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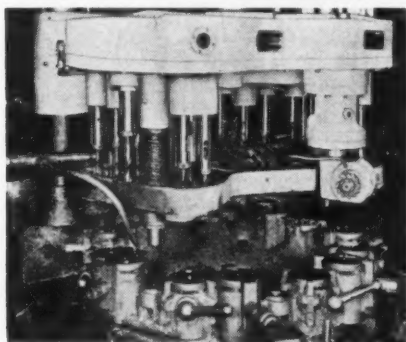


The unit is rated at 20 g.p.m. If the flow rate is increased beyond the rated capacity, excess coolant automatically overflows into base of unit before reaching the magnetic field. While the rated flow of clean coolant is delivered, the overage is returned to the sump of the machine tool, thus preventing spillage when clarifier is operated above rated capacity.

Completely automatic, the Magnetic Clarifier measures 22½" long by 16½" high by 15-3/16" wide. (Net weight is 145 lbs.) It operates on 1/12 h.p. 60 cycle 110 volt single phase motor. A

### Special 34-spindle drillhead

An unusual full ball bearing 34-Spindle Drillhead with a suspended bushing plate and oil circulating pump is introduced by the Thriftmaster Products Corporation, 1030 N. Plum St., Lancaster, Pa. This special drillhead (illustrated) is used for machining compressor parts at the Chattanooga plant



of the Norge Division of Borg-Warner Corporation. The parts, of pressure moulded cast iron, are held in an 8-station rotary indexing table while they are drilled, reamed, countersunk, trepanned and milled.

The pieces are machined first on one side and then turned and machined on the other side in a two cycle run. Each spindle of the drillhead turns at a speed suitable for the operation it performs, varying from 127 to 2000 r.p.m. A completed part is ejected with every stroke of the drill press spindle.

## SPECIFY KASSON PRECISION COLLETS AND ATTACHMENTS

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Step collet for accurate chucking to 2¼" dia. Soft head for easy boring. Lowest price on market! Models 3AT, 3C, 5C.

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DRAWBAR**  
½" cap.



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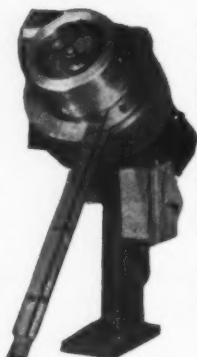
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Eliminate costly handling operations by delivering part automatically to work position. Parts poured into the motorized hopper are arranged and fed as required.

Several types available suitable for feeding a wide variety of parts.

Send sample of part to be fed when writing for quotation.

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Over 85% of the torque wrenches used in industry are

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in inch ounces  
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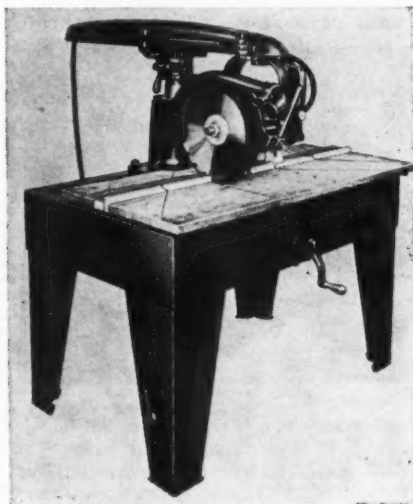


PA **STURTEVANT CO.**  
ADDISON QUALITY ILLINOIS

## DeWalt radial arm saw

DeWalt Inc., Lancaster, Pa., manufacturer of cutting machines for the wood-working, metal and plastics industries, is introducing a new radial receding arm saw, designated as the Model R-2.

The DeWalt low dead-rise, direct-drive motor permits a depth of cut that is about 40% greater than that possible with conventionally designated direct-drive motors, according to the manufacturers. The reduced interference of the bottom of the motors permits the arbor to be brought closer to the material being cut. The low dead-rise motor of the Model R-2 is wound with Formex Fiberglass insulation, and provided with grease-sealed-for-life bearings. A.C. motors of this type are totally enclosed to prevent explosions, and Universal a.c./d.c. motors used on this model machine feature a protected enclosure.



The arm of the Model R-2 rides smoothly on eight grease-packed, double-row bearings. Locating latches permit the rapid location of the cutting tool in any of the many cutting positions possible. DeWalt Model R-2 motors have thermal overload and manual push button starting switch. The machine is available in 3 and 5 h.p. sizes.

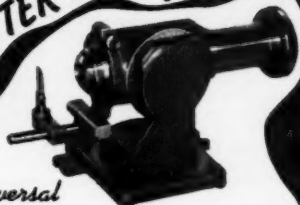


*"Take your time, boys. My Harry has a grip like a JACOBS CHUCK!"*

IF IT'S A  
**JACOBS**  
IT HOLDS

The Jacobs Manufacturing Co., West Hartford 10, Conn.

## NOW! A LOW-COST CUTTER GRINDING FIXTURE



### The *Universal*

CUTTER GRINDING FIXTURE fits any universal tool or surface grinder. The basic unit, shown here (standard accessories not shown), with its four attachments, below, provide a quick and accurate answer to nearly all cutter and tool grinding demands.

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◀ The MULTI-SWIVEL VISE attachment employs three swivels for quick set-up of any compound angle.



◀ This versatile INDEXING LOCK BRACKET may be set up in any position at either end of spindle housing on basic unit.



◀ For precision GRINDING WHEEL DRESSING this attachment will handle any two angles as well as set radius.

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REAMERS are also furnished in Right-hand spiral, right hand cut, as well as Left-hand Spiral, Right-hand cut.

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**TWENTIETH CENTURY  
MANUFACTURING CO.**

3720 MONTROSE AVENUE

CHICAGO 18, ILLINOIS

### Electric sprayer has spinner nozzle

A new all-purpose electric sprayer has recently been announced by Burgess Vibrocrafters, Inc., 180 N. Wabash Ave.,



Chicago 1, Ill. The device is equipped with a multi-vein spinner nozzle that imparts a swirling motion to the fluid being sprayed, aiding atomization. A selection of coarse and fine spinners for heavy or light-bodied liquids is furnished with the unit.

Entirely self-contained, ready to plug in and spray, the new all-purpose sprayer may be used with enamel, lacquer, glossy paint, wall paint, varnish, garden sprays, and water and oil based insecticides.

### Adjustable range recorder for test data

A new Speedomax electronic recorder is announced by Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa. The instrument features a range continuously adjustable over a 20:1 ratio, and zero suppression adjustable over more than twice the maximum range.

Through use of a particular suppressed zero range, an operator can ignore that portion of the range in which he is

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**HIGH SPEED Hammer Co., Inc.**

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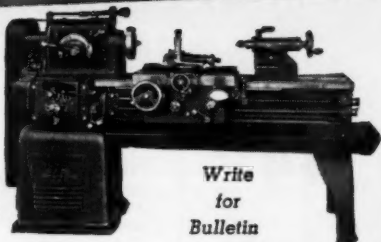
Rochester 21, N. Y.



## CARROLL and JAMIESON *Lathes*

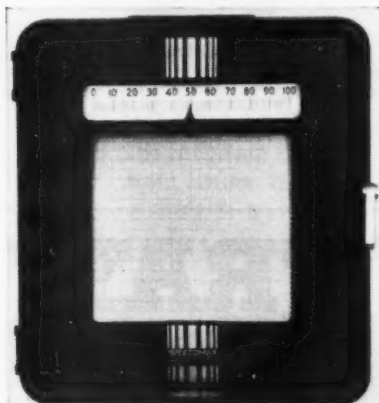
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not interested, while he spreads the few millivolts he wants to watch across the entire width of the instrument chart.



Adjustable range permits the user to select his own scale calibration at will.

Some typical measurements include:

Measurements with strain gages—for experimental stress analysis, weighing operations, etc. Adjustable zero compensates for tare weight; range can be adjusted to provide the desired scale calibration. Temperature difference measurements with thermocouples—in measuring small temperature changes at elevated temperatures. Speed measurements—Using an electric tachometer as the primary element, this recorder can measure change of speed over a narrow range, or assist in the study of speed regulation characteristics of motors, engine governors, etc.

Calibrated d-c millivoltage range is adjustable from a minimum across-chart span of 1.1 mv to a maximum range span of 22 mv. Uncalibrated coarse and fine rheostats provide maximum zero suppression of -50 or +50 mv, continuously adjustable between these limits. These adjustments are independent. Range remains constant during zero adjustment; zero suppression remains constant during range adjustment.

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Is YOUR problem DIFFERENT? We have met and solved thousands of such problems—from cameras and meters to toys and electrical items. Anything for staking or riveting fixed or movable joints—anything in eyeletting, grommeting, burring, pointing with platinum, tungsten, silver—whatever your problem, we can help you.

WHY? — HOW? Simply accumulated experience, plus best high speed machinery built. Safe, simple — uniform, adjustable hammer blow — fast or air operation. Dual action feature holds work firm, rigid. Cuts costs amazingly — assemblies, stakes, in one operation even with slight thickness variations. Prove it for yourself. No obligation. Write us.

See our ad on  
Cold Riveters  
at left

**HIGH SPEED Hammer Co., Inc.**

311 Norton St.  
Rochester 21, N.Y.



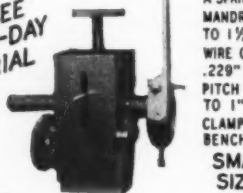


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60 SECOND ACTION FOR  
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PITCH CAPACITY UP  
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CLAMPS IN YOUR  
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Write "Mr. MONTY," the Tool Detective,  
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**MONTGOMERY & CO., INC.**

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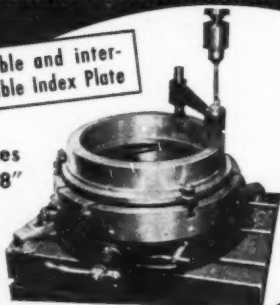
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BALL BEARING INDEXING TABLE

Removable and inter-  
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Three Sizes  
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Also Worm-  
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It's safe—no projections. Smooth,  
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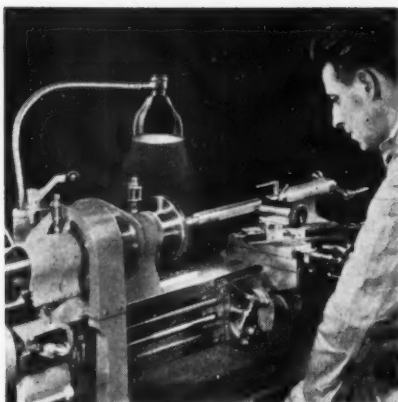


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Vimcolight In Use on a  
Rivett 608 Lathe

# VIMCO<sup>Light</sup>

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Vimcolights help machine tool designers maintain top machine performance by preventing eye fatigue. And good performance means good will . . . means satisfied customers and repeat sales for you.

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Vimcolights are sturdy, versatile, and easy to install. Special applications handled by our engineering staff. Bulletin 74 illustrates our complete line.

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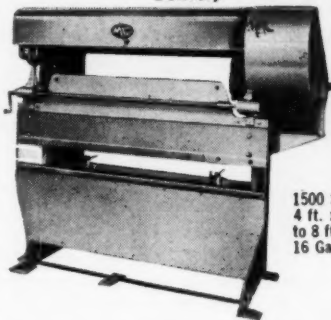
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1500 Series  
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to 8 ft. x  
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## Lowers Production Costs Through Greater Accuracy

The M/W Press Brake has been designed and engineered to provide greater and more permanent accuracy. There is no chance for human error in construction. The gibbing and all moving parts are machine located in an integral frame. Ram adjustment is through powerful alloy steel screws with opposite buttress threads to equalize thrust loads and lower maintenance costs. Right hand drive power transmission reduces torsional shafting deflection providing permanent accuracy. Anti-friction bearings reduce operating and maintenance costs.

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Machinery Division

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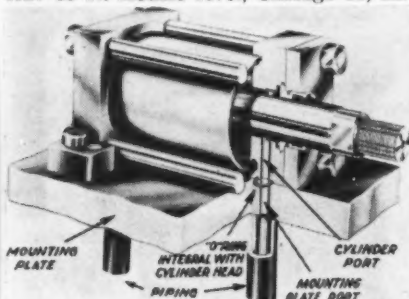
Manufacturing Company

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### Air-hydraulic cylinder mounting

Rapid installation of air and hydraulic cylinders singly or in space-saving, manifold mounting without the labor and expense of making the actual pipe connections to the cylinders is an advantage of the new "O" Ring Cylinder mounting offered by Miller Motor Co., 4027-35 N. Kedzie Ave., Chicago 18, Ill.



The air or hydraulic piping is directly connected to ports in a machined flat surfaced mounting plate or manifold, and the cylinders are mounted on this

plate with their ports mating in perfect alignment with the mounting plate ports. "O" Ring seals at the mating surfaces of the cylinder ports assure a leakproof seal under pressure and suction; they conform to the J. I. C. Hydraulic Standards. The "O" Ring seal is preassembled into the port of the cylinder, eliminating the job of installing the "O" Ring assembly separately. The mounting flanges of the cylinder are secured to the mounting plate by regular mounting bolts or screws. Thus, installation, removal and replacement of cylinders are simply accomplished without having to connect or disconnect any piping. Installation or removal of the mounting bolts or screws is all that is necessary.

### Improved model shell trimmer

The Dayton Rogers Manufacturing Co., 2824 - 13th Ave., South, Minneapolis 7, Minn., announces a new technique in flat edge trimming of square, rectangular and irregular shaped drawn shells with small corner radii.

This new Model 2-A Drawn Shell



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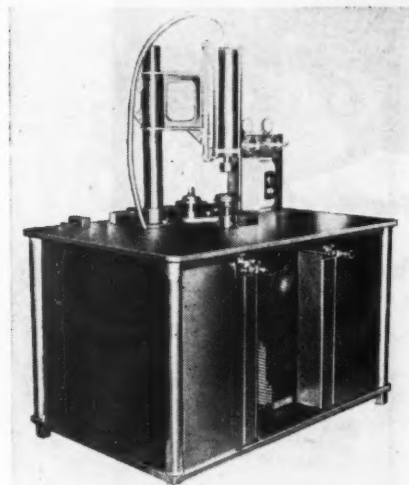
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Fills the long-felt need for a portable, inexpensive and dependably accurate machine for making small dies, molds, templates, etc. Extremely simple to operate.

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- Entire spindle assembly removable to facilitate cutter grinding.
- Rugged cast iron construction with exclusive adjustments for insuring quick, accurate setting.

Trimming Machine not only flat edge trims all drawn shells, but also has capacity for forming, offsetting, beveling, beading, serrating, stenciling and other such operations. By the introduction of a universal tooling method, these operations can be performed at a fraction of the cost of conventional methods, according to the manufacturer.



This new machine will perform all such operations on drawn shells of practically any depth and from any sheet alloy stock up to and including thickness of 13 gauge. The equipment is provided with a standard 3 h.p., 1750 r.p.m. motor, requiring shop air pressures varying from 20 to 80 pounds p.s.i. The complete machine weighs about 3000 lbs.

#### Graham variable speed drives

The new "150" series of Variable Speed Drives is announced by Graham Transmissions, Inc., 3754 N. Holton St., Milwaukee 12, Wis. Previous Graham transmissions in sizes from  $\frac{1}{2}$  to  $1\frac{1}{2}$  h.p. were driven at 3600 r.p.m. and where lower input speeds were used, the drives were spring loaded. The new "150" series is designed for operation at input speeds of 1800 to 1200 r.p.m. without spring loading.

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Vertical  
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**A Precision Tool That Fits 9" South  
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**DU-ONA-LATHE—THE PERFECT PRECISION  
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patterns.
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Milling
3. Does Layout  
Work.
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Cams.
5. Does Flycutter  
Facing.
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grinder can  
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money; equip-  
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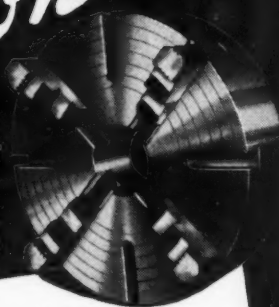
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## INDEPENDENT LATHE CHUCKS

All types of mountings



### Feature Gives Jaws "Steel Finger" Action

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Lower input speeds give cooler, quieter operation with increased efficiency and greater durability under severe continuous applications, according to the manufacturer. Absence of spring loading makes it possible to change the speed of the transmission while running or stationary. Inbuilt speed regulation provides accuracy of speed holding, even under conditions of wide load variation. Inherent overload protection keeps the transmission and the driven machine from damage due

to overload or jam in the driven equipment.

All units in the "150" series are available with motor or with input shaft extension for coupling to a separate motor on belt drive from the other shaft of the machine. All sizes may be had either with standard output construction delivering speeds from .37 input speed to 0, or with a variety of types and ratios of built-in gear boxes, including single stage spur reducer, double reduction helical spur reducers, spur gear set-ups, etc.



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For constant or interchangeable coding, inspecting, identification or decorating of a limited number of parts a day, a hand or rocker-style stamp may be all you'll need. Where your production runs into thousands every day, you'll prefer an automatic, high-speed marking unit. In either case, you'll do it better with a Matthews Marking Device.

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Production or short-run keyway cutting can be accomplished in all types of bushings, sleeves, gears, etc., with the GLENNY adjustable push broach. Featuring 0.0005-inch accuracy, it can be instantly adjusted and micrometer checked for precision operations.

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GLENNY broach sets are available for cutting keyways in bores ranging in diameter from 1/4" to 2 1/2".



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#### KASE MACHINE COMPANY

Please send (without obligation) your new Bulletin No. 13 containing sizes, specifications and prices of GLENNY broaches and kits.

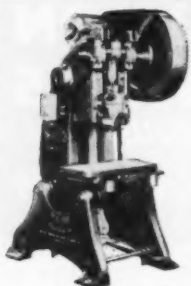
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**An Ideal Press  
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The Walsh No. 38X Deep Throat 38  
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Write Dept. "A" for Catalogs  
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## Heavy Duty • Bench Type ENGRAVING MACHINE

Interchangeable heads for engraving, electrical marking, and acid etching . . . available for all models. Also Panto engraving cutters, cutter grinders, master copy type, endless belts and accessories.



The PANTO  
MODEL UE-3

SEVERAL OTHER MODELS AVAILABLE

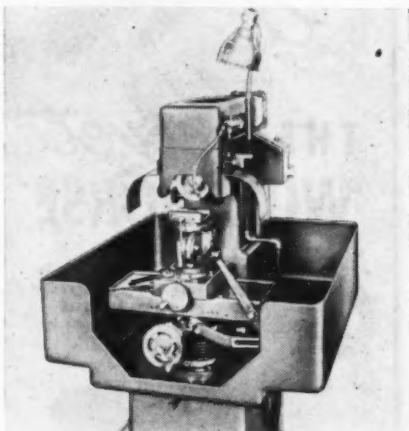
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**H. P. PREIS ENGRAVING MACHINE CO.**

647 STATE HIGHWAY 29 • HILLSIDE, N.J.

## Hammond carbide tool grinder

A new addition to the line of Carbide Tool Grinders manufactured by Hammond Machinery Builders, Inc., 1614 Douglas Ave., Kalamazoo, Mich., is the Model CB-77-W, Wet, Combination Chip Breaker and Diamond Finishing Grinder.

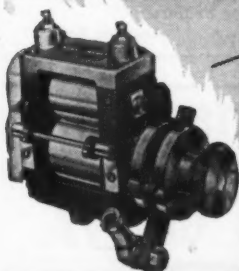


This dual-type grinder is designed on the cup wheel side for diamond finishing. It accommodates either 6" or 7" diameter cup wheels, and the table tilts to any point between 25° above to 30° below horizontal by simply unlocking a lever. The table assembly is moved in and out from the wheel by a feed screw rather than by manual operation which would tend to damage the wheel. The wheel is changed simply by backing the table away and removing the wheel mounting screws.

The chip breaker side of the grinder is not only for grinding chip-breakers but is also designed for use with the Hammond "VC" solid carbide insert grinding fixture. The movements provided for chip breaker grinding are: vertical with hand wheel and dial calibrated to .001", traverse in and out from wheel, with handwheel and dial calibrated to .001", and reciprocation underneath the wheel with a lever-operated table travelling on ball bearing ways.

## A UNIVERSAL FAVORITE: ROLL FEED \$89.50

A truly remarkable unit which is a universal favorite and priced within your budget. Quality built for long dependable service. Models available to fit all sizes of power presses.



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Pawtucket -:- Rhode Island  
Builders of Electric Precision Die Millers

Coolant is provided by a self-contained pump and tank unit which serves both the chip breaker and cup wheel sides. The machine is equipped complete as shown above except for grinding wheels.

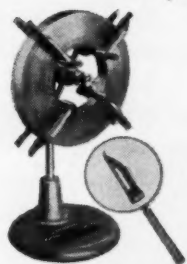
### Master pneumatic impact wrench

A new pneumatic-type impact wrench, incorporating a simplified impact mechanism, is introduced by the Master Pneumatic Tool Co., Orwell, Ohio. Used for both driving and removing nuts, studs, screws, etc., in all types of assembly and sub-assembly, the new Master Power Model M950 Impact Wrench is rated for  $\frac{3}{8}$ " bolt size capacity on most work. By the use of an air inlet control valve, this one size of tool may be used for a wide variety of sizes of work.

The tool is made with only two impacting parts, and contains no springs nor gears. Impacting takes place only when the nut begins to tighten. The reverse valve is accessible to the operator's thumb. A feature of the wrench

## THE "RFC" MODEL 2 STOCK REEL

Save time . . . speed production with this sturdy yet economical stock reel. Equipped with adjustable clamps, coils can be positioned quickly and easily. Controlled reel tension. Adjustable angle bracket available. Quick acting clamps for speedy positioning without bolts or screws.

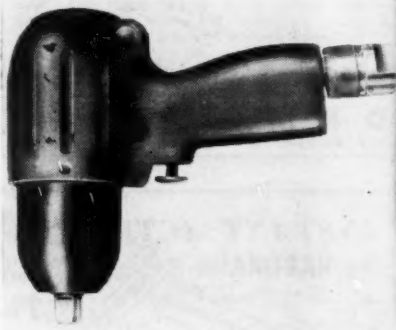


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is a steel clutch housing to lengthen the housing life. The handle and motor housing unit is a one-piece magnesium casting, containing an oil reservoir with



an automatic oiling device. The wrench operates on air pressure of from 80 to 100 p.s.i., and consumes 16 to 17 c.f.m. under load. The tool weighs approximately  $5\frac{1}{4}$  lbs.



## Automatic

## CHUCKING and INDEXING FIXTURE

- 1.—1800 light cuts per hour.
  - 2.—Either horizontal or vertical position.
  - 3.—Collets changed instantly.
  - 4.—Automatically knocks piece out.
- Model D—Ratchet indexing only—1" cap.  
 Model E—Both degree and ratchet indexing  
     —Capacity up to 1"  
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- No Springs
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• This punch press guard meets the most exacting standards of safety engineers and safety laws. Permits operator to feed the press without hindrance.

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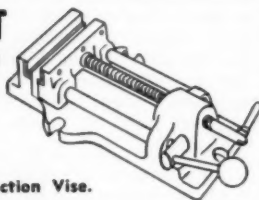
All Purpose Tool Room and Machine Shop Vises.

## The JAWSET

Adjustable Pressure Production Vise.

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Saves over 78% in labor and time. In all grit sizes as fine as .0001". Available in ophthalmic-tipped tubes or in new applicator gun that delivers minimum quantities to individual jobs and eliminates all waste.

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B & S No. 9	1"	6"	\$17.50
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" 10	1 1/4"	10"	20.50

## Arbor Spacers For Milling Machines IN SETS

Set contains 19 pieces: .001, .0015, .002, .003, .004, .005, .006, .007, .008, .010, .012, .015, .020, .025, .047, .062, .093, .125.  
(For fast, accurate spacing of Milling Cutters, Gang Saws, Slitters.)

**3 POPULAR  
SIZES**

Hole Diameter	Outside Diameter
7/8"	1 3/8"
1"	1 1/2"
1 1/4"	1 3/4"

**PRICE  
PER SET  
\$1.50**

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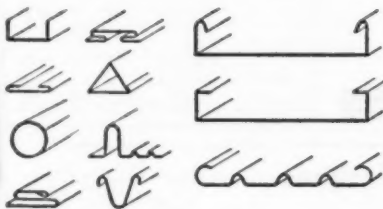
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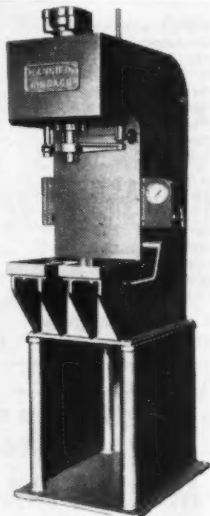
Also Pittsburgh Lock Machines, Pipe  
and Elbow, Beading, Turning Machines  
and all other Sheet Metal Working  
Machinery. Your inquiries invited.

**MAPLEWOOD MACHINERY CO.**

2634 Fullerton Ave. Chicago 47, Illinois

## Hannifin 5 and 8 ton presses

New 5-ton and 8-ton hydraulic presses are announced by Hannifin Corporation, 1129 S. Kilbourn Ave., Chicago 24, Ill. Typical applications include forming, bending, trimming, staking, riveting, and press-fit assembly work on production lines, as well as general purpose or utility service when installed singly in large or small shops.



Designated as the F-50A (5-ton) and the F-80 (8-ton), they are also offered with larger motor and pump, and consequently higher ram speeds, as the F-51 and F-81, respectively. Still higher ram speeds can be furnished when needed. Single manual lever control—handle down, ram down; handle released, ram up—is standard, but dual manual levers and electric push button control are both available. Another feature that is useful for repetitive production operations is that the stroke can be shortened, by limiting the return stroke to the point where the ram just clears the work. Thus no ram motion, and therefore no productive time, is wasted. The force exerted by the press can be also adjusted, anywhere in the range between 10% and 100% of maxi-

imum capacity, so the press will repeatedly deliver the exact pressure needed. The base, for floor mounting, shown in the picture is specially designed for these presses. They are also available without the base, for bench mounting.

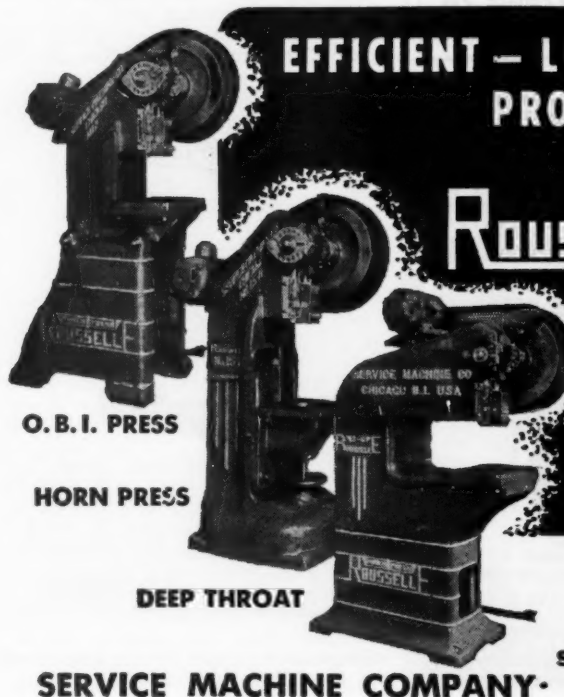
Both models have a maximum stroke of 10" and a gap of 16", and a reach of 7½". The ram speed of the Model F-50A (5 ton) is 120" per minute down, and 240" per minute up, with a 1200 r.p.m. motor. The ram speed of the Model F-80 (8 ton) is 73" per minute down, and 151" per minute up, also with a 1200 r.p.m. motor. Ram speeds are considerably higher in the models of larger motor and pump (Models F-51 and F-81). The pump volume is 5 g.p.m. on both standard units and 8 g.p.m. on the larger h.p. models. The oil reservoir is 11 gallons capacity on all models. Cylinder bore is 3½" on the 5-ton models and 4½" on the 8-ton models.

#### Klipxon screw driver designed with effective screw holder

Vaco Products Co., 317 E. Ontario St., Chicago 11, Ill., has introduced a new screw driver which is equipped with a sturdy, ingenious screw holder in the form of a spring clip which may be slid back up the shaft, out of the way when not needed.



The new tool is designated as the Vaco Klipxon. It is easy to secure a screw to the screw driver bit for starting a screw in a recessed hole, and equally easy to extract the screw. There is no interference from awkward mechanical devices while inserting or



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PRODUCTION**

MEANS

**ROUSSELL**

**PUNCH  
PRESSES**

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**DEEP THROAT**

**SERVICE MACHINE COMPANY**

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MARVECO  
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**PROVIDE A QUICK, EASY-TO-SET-UP  
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TRUNION VISE AND ANGLE PLATE**



- A sturdy precision 5" vise!
- Precision Ground angle plate!
- Swivels 360°, clamps rigidly in seconds.

**Send for Circular AV5**

**CONRAD MACHINE CO.**  
State Rt. No. 53 & Hay Rd., Lombard, Ill.

removing screws from deep holes. Visibility of the screw slot is unimportant when extracting a screw, since the Klipxon can be made to grip the screw through sense of "feel" and light pressure.

To secure a screw to the Klipxon Screw Driver "in the open," the clip is moved forward along the blade until the end of the clip extends beyond the bit. The clip is then inserted into the screw slot by holding the screw firmly, and sliding the bit forward toward the head, exerting enough pressure to close the gap between clip and bit so as to seat the bit in the slot. The screw is held firmly, and the user may proceed confidently. Extracting a screw from a countersunk hole is done in the same manner, except that the screw is held in the hole instead of by the fingers.

#### **Lees-Bradner threading calculator**

A simplified, useful slide rule for determining threading time on the Cri-Dan single point, semi-automatic high speed Threading Machine, has recently

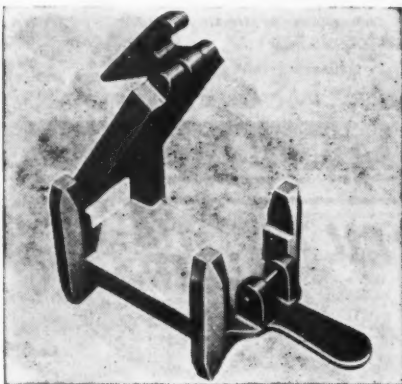


been made available by the Lees-Bradner Co., Cleveland 11, Ohio.

The calculator is of particular value in estimating times within the Cridan's wide range of capabilities, since the machine is particularly suited for internal or external work, right or left hand, straight or tapered threads of any profile, all or any of which are produced with a simple, inexpensive single point carbide or high speed tool.

### Parlec box drill jig available in five sizes

The demand for the Parlec Drill Jig has again become so great that Universal Tool Co., Hawthorne, Calif., has again begun to produce these ingenious devices in quantity. The national sales agents are Franklin E. Smith & Associates, 6201 Carmelita Ave., Bell, Calif.



The Parlec Drill Jig enables the tool-maker or drill operator to simply machine the base of the jig for properly locating the part to be drilled, cut holes in the cover, and insert the bushings to complete the jig required. The unit is sturdily constructed of nickel iron and normalized.

The Parlec Box Drill Jig is now available in five standard sizes:  $1\frac{1}{2}$ " x 2", 3" x  $3\frac{1}{2}$ ",  $3\frac{1}{2}$ " x  $5\frac{3}{4}$ ", 6" x 6" and  $1\frac{1}{2}$ " x 6". Jigs with special sizes for covers and special heights can also be furnished. Master layouts are supplied at no additional cost, which, when placed under a drawing of the part to be drilled, enables the part designer to specify the size of the jig to be used for drilling the particular part.



## Universal Stock Reel

The Humm Universal Stock Reel is an essential device for the handling and feeding of coil stock to Power Presses.

1. Adjustable Reel to fit various sizes of coil.
2. Reel is adjustable to suit height of Press.
3. Reel can be inclined to any position.

Stock Reel with plain bearing \$55.00

Stock Reel with roller bearing \$63.00

Manufactured By

**John Humm Safety Equipment Co.**  
253 SHEFFIELD AVE., BROOKLYN 7, N. Y.

## HOWALD CARBIDE MILLING CUTTERS



PATENTED  
END MILL

- SQUARE BLADES Easily Replaced.
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The S and S stock reels with quick loading arms are designed for the economical handling of stock from coils. Constructed with a snap lock knuckle joint for loading. These reels may be set in any plane from vertical to horizontal. Double swivel reels are manufactured so that loading is possible while other spool is reeling out stock.



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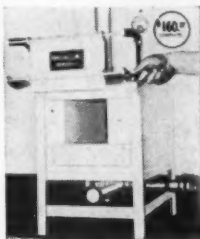
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**FAST METAL CUTTING  
... MADE EASY!**

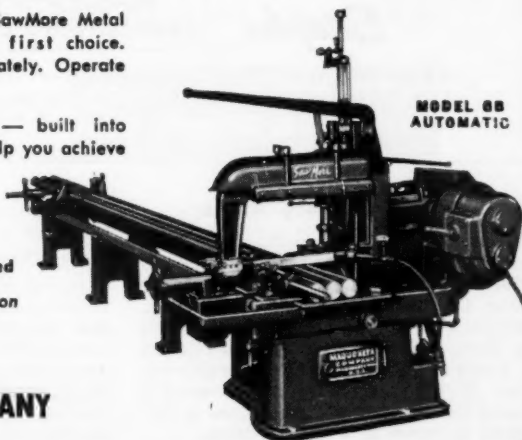
If it's speed you need ... SawMore Metal Cutting Machines are your first choice. SawMore Machines cut accurately. Operate at lowest cost.

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- Gears—constant mesh
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SawMore Machines

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MODEL 88  
AUTOMATIC

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CARBIDE-TIPPED CUTTING TOOLS**

A COMPLETE LINE OF SINGLE AND MULTIPLE POINT CUTTING TOOLS — EXPANSION REAMERS—FORM TOOLS—CENTERS—MASONRY DRILLS—SPECIAL TOOLS



**Ross solenoid safety valve**

Greater safety for operators is provided by a new air control solenoid valve introduced by Ross Operating Valve Co., 120 E. Golden Gate Ave., Detroit 3, Mich. The model, known as the Ross Safety Valve, was developed in cooperation with safety engineers. Even if the air or electrical supply should be interrupted, the valve is designed to move to a safe position.

The new valve is designed with the

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A Ful-Flo orifice provides maximum capacity. The major pistons and poppets are tied together in one unit to assure simultaneous movement. The use of an over-size exhaust gives faster control. Free, continuous operation is provided by floating the pilot operating lever on needle bearings. The solenoid protecting cover, which is hinged to prevent

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PROMPT DELIVERIES

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• Thousands upon thousands of Zagar collets, holding and indexing fixtures called into service before World War II began are still performing most profitably. *Advantages:* No vertical movement of collet. Chips self-clearing. Close tolerances. Top production with extreme accuracy. For slot milling, straddle milling, drilling, tapping, grinding.

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**Zagar** **TOOLS FOR INDUSTRY  
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loss, provides easy accessibility and protection against dust, water and other external elements. An opening in the cover permits manual operation. Groups of valve parts are removable as assemblies, simplifying maintenance.

The valve ordinarily operates with line pressures of from 40 to 125 p.s.i., but can be designed to work outside of these limits. The valve is available in 1/4" to 1 1/4" pipe sizes, straightway or 3-way, normally closed or normally open.

#### HERRINGBONE QUIZ

Answers to quiz on page 156.

1. Full width of face
2. Oil film formed by tooth wedge action
3. Large
4. Side thrusts
5. No side thrusts
6. Stronger
7. Less expensive
8. Medium
9. Large
10. No side thrusts



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- Tools
- Wheels
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We are specialists in diamond tools for J & L, Ex-Cell-O and other thread grinding applications. J & L NX 574-75 or X-L-O 48-4105 tools with natural sharp octohedron diamonds, concentric within .001", set in cast beryllium copper, available at \$3.00 each. **Prompt delivery. Resetting charge \$1.00.**



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2-inch capacity, \$145; 3-inch capacity, \$295;  
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Round, square or hex collets, plain-serrated  
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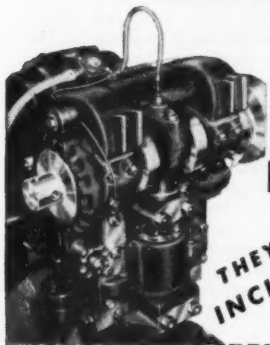
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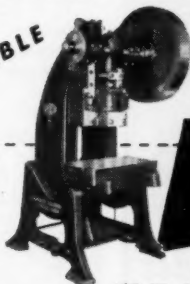
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**JOHNSON POWER  
PRESSES ARE THE BUY!**

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INCLINABLE**



Because Johnsons are built extra husky, you can do bigger jobs on smaller presses. Why not pay yourself a production bonus the Johnson way?

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Shear . . . woodworking . . . all straight knives receive a precision cutting edge that stays sharp longer when ground on this famous NT grinder. The **fully automatic** NT is loaded easily . . . grinds smoothly . . . and maintains the fine temper of all alloy knives. There are 11 sizes for knives from 38" to 160" long. Write for further information.



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The type SC **completely services** any carbide tipped circular saw up to 20" diam. and larger on special order. Save production dollars by having an SC in your own plant. Write today.

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## Test indicator and surface gage

The Koch Test Indicator, claimed to be the only tool maker's indicator on the market with two working ends, one end to test outside surfaces, the other for inside surfaces, has been introduced by Andrew Genales, 28 Second Ave., Nyack, N.Y. The Koch indicator is scientifically designed to give extreme sensitiveness combined with strength. It offers smooth action, plus high magnifying power.

It is said to be the only low friction indicator which has a torsion spring as well as a compression spring, assuring sustained accuracy. Each graduation on the indicator's scale represents 1/1000" movement of the plunger. The instrument is so designed that the plunger moves away from instead of against the lever, preventing the delicate parts from being broken by excessive plunger jolt.

The Koch Test Indicator is now available with a complete set of attachments which adapts it for inspection work on a surface plate, set-up work on milling machines, and testing flat surfaces where surface gages are frequently used. A surface gage and indicator attachment are available with the instrument. The new Universal Surface Gage is equipped with a positive lock, preventing slipping and loss of measurements by the Koch Test Indicator.

## Bliss 150-ton perforating press

A new 150-ton high-speed perforating press to punch slots, rounds or ovals, either in straight rows or with alternating rows staggered, has been

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**SPUR  
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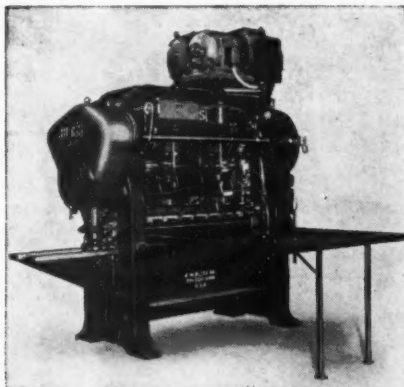
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developed by E. W. Bliss Company, at its Canton, Ohio, plant. Built to operate in a speed range from 100 to 200 s.p.m. with a variable speed drive, the press can handle a maximum sheet width of 54".



The stagger motion is accomplished by feeding the sheet straight through

the press and by moving the punch and die from side to side. The amount of stagger is adjustable. A counter attachment can be set to stop the press automatically after a pre-determined number of rows have been punched. This is useful where blank spacings are required. An automatic safety device stops the feed before the tail of the sheet reaches the punching line, leaving any desired margin between the last row of holes and the edge of the sheet.

The precision feeding mechanism consists of entry and exit feed rolls of hardened alloy steel, driven by a feed crank adjustable for different feed increments. The stroke of the slide can be adjusted for different stock thicknesses.

A releasing mechanism, provided for the upper gripping rolls, releases both rolls simultaneously. For easy installation of die sets from the front or back of the press, the feed rolls can be slid on to a support bracket extending to the side of the press. A die can also be inserted through the uprights.

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*Adjustable  
Self Centering*

For feeding strip and wire coil stock to presses. Coil capacity 300 to 500 lbs. Outside ring dia., 28" to 36". Height of reel, 36". Wheel automatically adjusts parts to suit inside diameter of coils from 11" to 20". Arm allows for quick conversion to horizontal or vertical position and adjusts height of reel.

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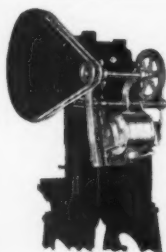
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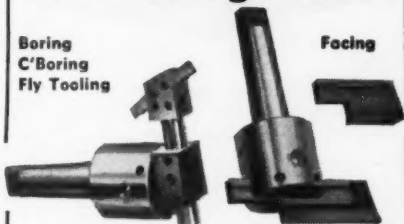
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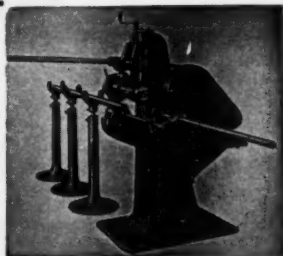


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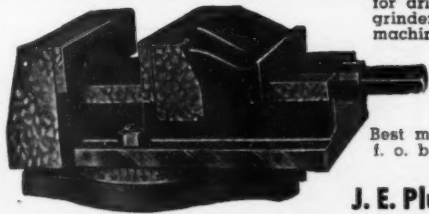
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In ordering this vise give size of slot in table:  
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Best material and workmanship. Prices are net f. o. b. Chicago. Dealer's inquiries are solicited.

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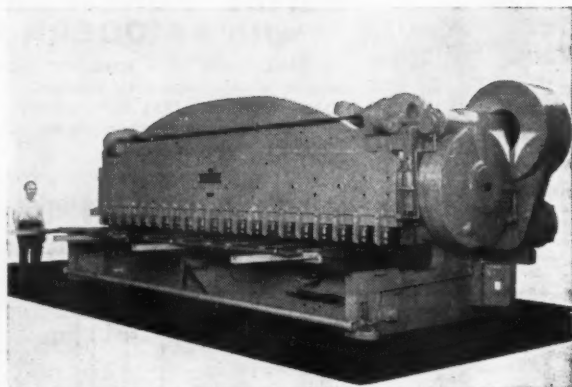
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A Cincinnati Shear with a capacity of 20' of  $\frac{1}{2}$ " mild steel plate is the latest addition to the line of All-Steel Squaring Shears manufactured by The Cincinnati Shaper Company, Hopple, Garrard & Elam Sts., Cincinnati, Ohio. This squaring shear, believed to be the longest  $\frac{1}{2}$ " shear ever built, was produced for the Butler Manufacturing Co., Galesburg, Ill.

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and have a vacuum pump arrangement that prevents leakage of hydraulic oil. The shear has a 24" throat or gap and a 48" back gauge range.

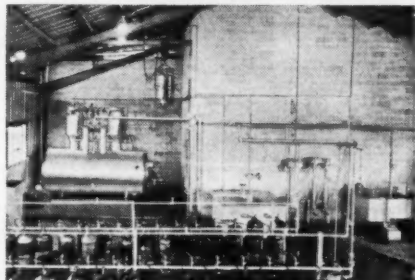
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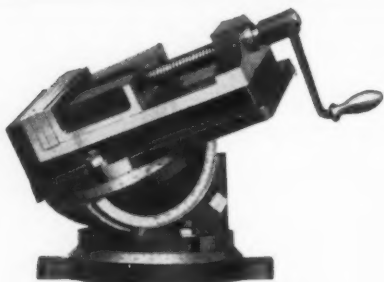
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When ordering, specify amount and bolt thread size.

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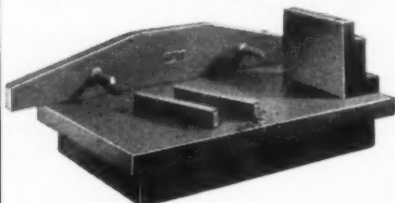
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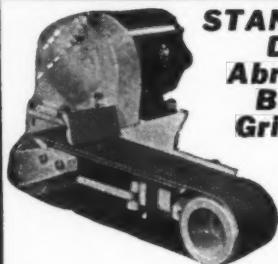


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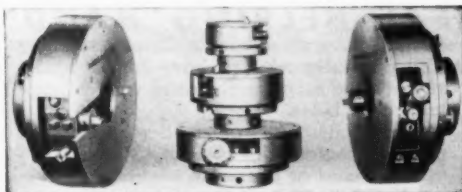
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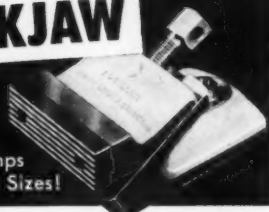
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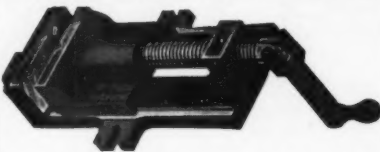
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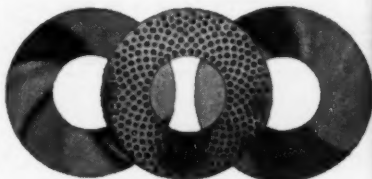
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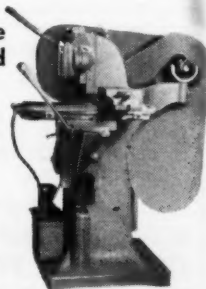
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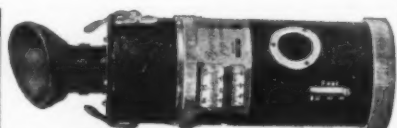
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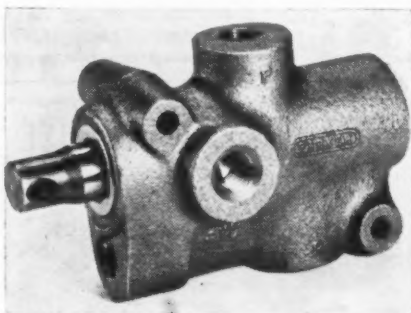
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## Parker hydraulic control valve

A new hydraulic control valve is an-  
nounced by The Parker Appliance Co.,  
17325 Euclid Ave., Cleveland 12, Ohio.  
This open center, single spool, three-  
way valve is based on models supplied  
to individual manufacturers, and is now  
being made generally available by rea-  
son of expanded production facilities.



Said to be suitable for heavy duty  
service on construction and materials  
handling machinery, the valve operates  
at pressures up to 2000 p.s.i. and fea-  
tures an externally adjustable, built-in  
relief valve, sized to handle full pump  
capacity up to 14 g.p.m.

Pressure drop through the open center  
of the valve is held to only 10.25 p.s.i.  
at 14 g.p.m., imposing a minimum load  
on an engine-mounted hydraulic pump  
and little loss in engine power while  
the valve is in the neutral or holding  
position.

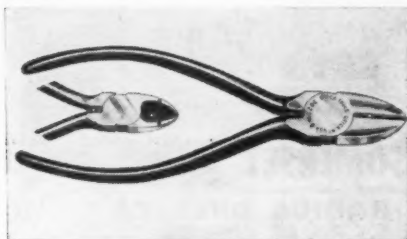
Cylinder and pressure ports are avail-  
able in 1/4", 3/8" or 1/2" internal pipe  
thread size, while the return port is  
sized at 3/4".

## Utica "Lubring" cutting pliers

The "Lubring" line of self-lubricating  
pliers manufactured by Utica Drop  
Forge & Tool Co., Utica 2, N.Y., has  
two new additions which feature wide  
opening jaws and maximum strength  
around the rivets. The new models are  
a 6" Diagonal Cutting Pliers, No. 241,  
and a 6" Diagonal Cutting Pliers No.  
242SW (illustrated), with a wire strip-  
ping hole in the blade and sleeve  
grooves or wire twistors with W-shaped

stripping notches on the back of the head.

The use of a round joint in place of the common or slab joint gives greater bearing in the counterbore, which in turn means greater strength around the rivet. The thinner design is 20% lighter in weight, but equivalent in strength to older models.



The "Lubring" line is distinguished by its ring of porous, oil-bearing iron which rides in the joint. As the pliers are used, the ring gives up oil, lubricating the pliers as the oil is needed, and assuring a smooth working joint of exceptional life.

### Hydro-Borers have close tolerances

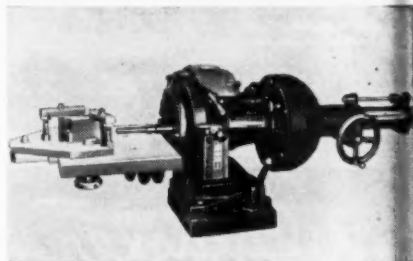
Hydro-Borer Company, Dept A-51 1511 W. Florence St., Inglewood, Calif., announces two new precision horizontal hydraulic boring machines which meet work tolerances to  $\pm .0003$ ", and finishes to "aircraft" specifications. The boring capacity is given as  $\frac{5}{8}$ " to  $6\frac{1}{2}$ " dia.

Among the features stressed are: (1) the work is stationary and only the boring tool revolves; (2) the surface to which the work fixtures mount is hand scraped to .0003" of square and at 90° to the spindle; and (3) work-holding fixtures can be mounted on the face of the Hydro-Borer and precision finished on the machine itself.

The feed mechanism of the Hydro-Borer consists of a threaded piston rotating in a cylinder of oil. This oil chamber is a self-contained part of the machine and no pump or separate oil supply is involved. Oil transfers through the threaded piston from one side of the piston-spindle assembly to the

other, moving the spindle into and through the work.

The spindle drive in the Hydro-Borer is provided by a  $\frac{1}{2}$  h.p. motor with V-belt drive to multiple pulleys, which provide shaft speeds of 460, 900 or 1400 r.p.m. The maximum feed is predetermined by lead and depth of thread on piston and is fixed at .004" although lesser feed can be obtained by controlling the by-pass valve used to put the feed in motion. The nose of the spindle is taper ground eccentric to the center of rotation which enables the operator to adjust the cutting tool a total of .014", by advancing the boring head clockwise in the spindle. The boring heads are all calibrated and the spindle has an identifying mark to give the operator a direct reading in thousandths of an inch.



The Hydro-Borer can be moved from job to job and conveniently placed next to the mill or lathe which handles the preceding operation. The Model "A" Hydro-Borer horizontal hydraulic boring machine measures 39" x 27" x 32" overall and weighs approximately 300 lbs. Model "C" measures 39" x 27" x 14" overall and weighs approximately 200 lbs.

### REPRINTS AVAILABLE

Readers' attention is called to the fact that there are still available several reprints of the more recent Special Reports on American Machine Tools which have appeared as a regular monthly feature in the past twelve issues of Machine and Tool Blue Book. Copies may be secured upon request by addressing the editorial department.

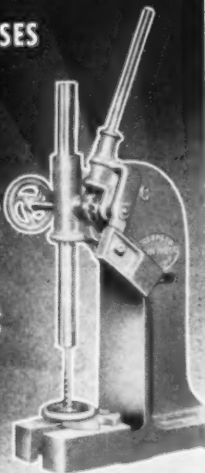
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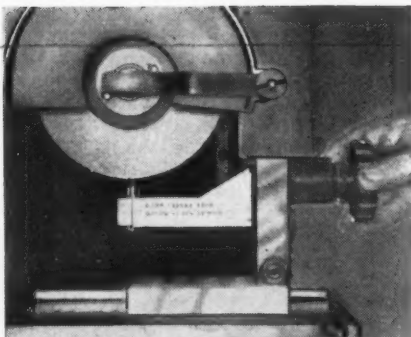
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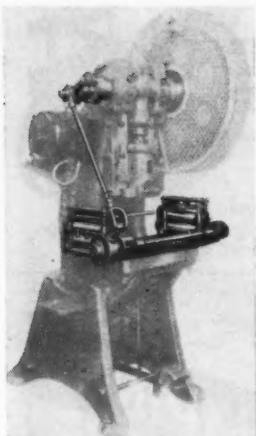
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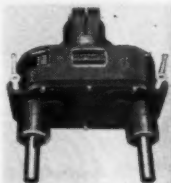
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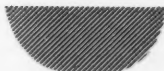
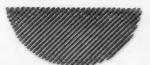
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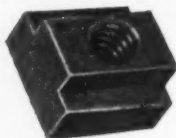
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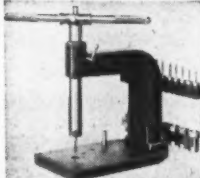
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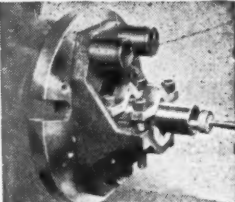


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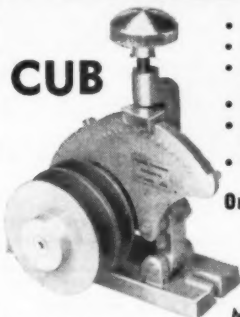
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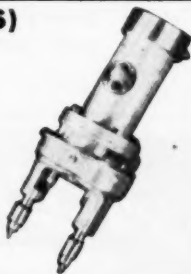
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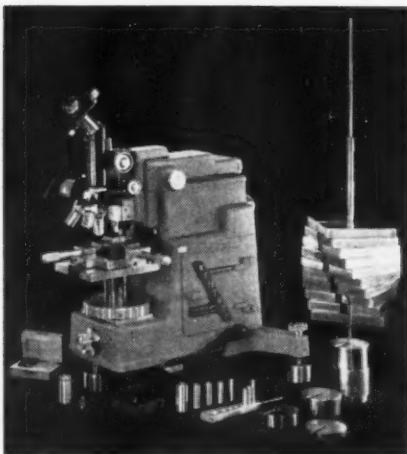
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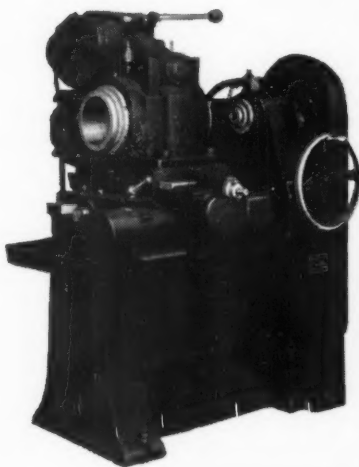
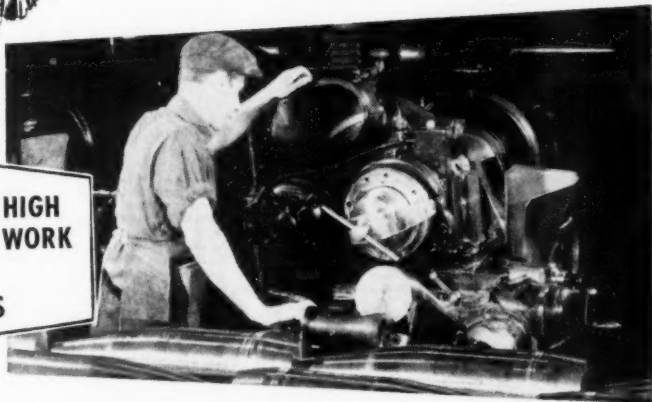


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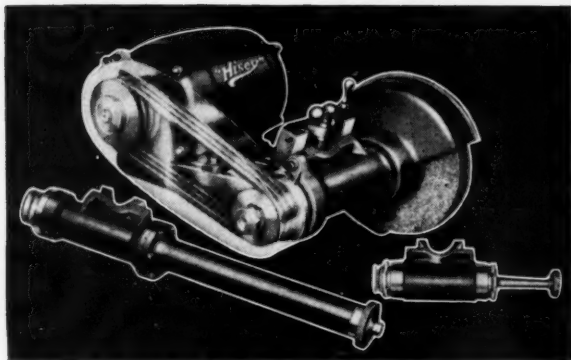
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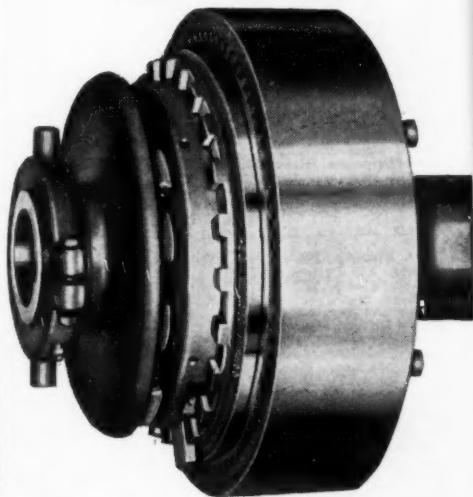
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15/64	12	9	1.95
1/4	12	9	1.95
17/64	12	9	2.05
9/32	12	9	2.05
19/64	12	9	2.20
5/16	12	9	2.20
21/64	12	9	2.50
11/32	12	9	2.50
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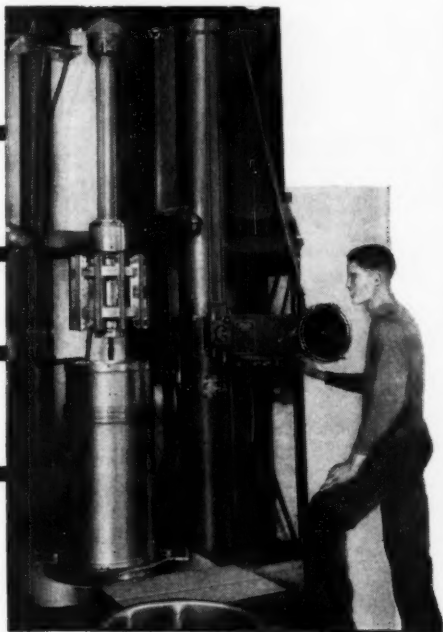
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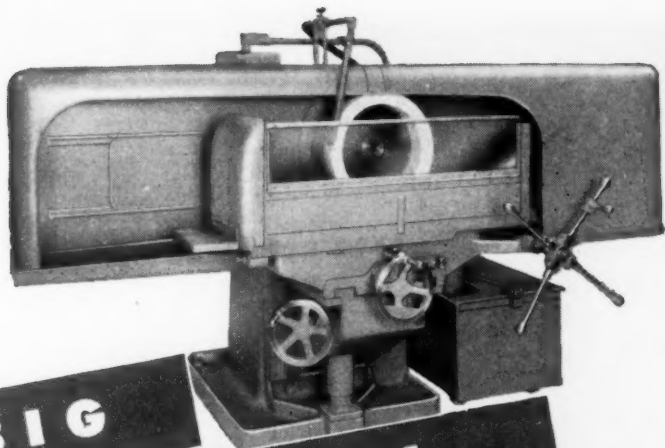
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**Feeds:** All hand feeds — transv.  $3\frac{1}{2}$ "; vert.  $7\frac{1}{4}$ "; long, 24"

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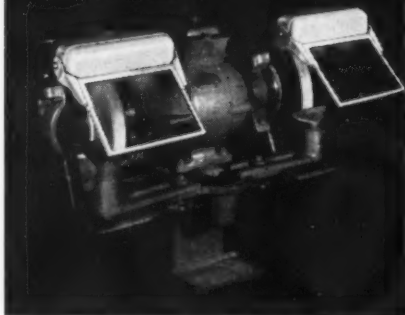
**Net weight:** 3900 lbs.

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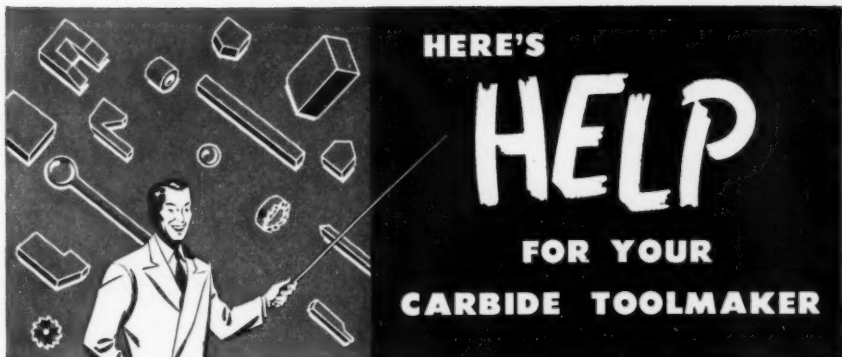


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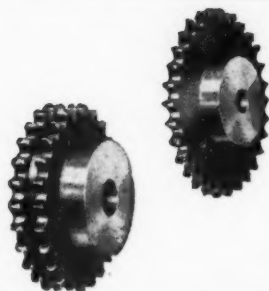
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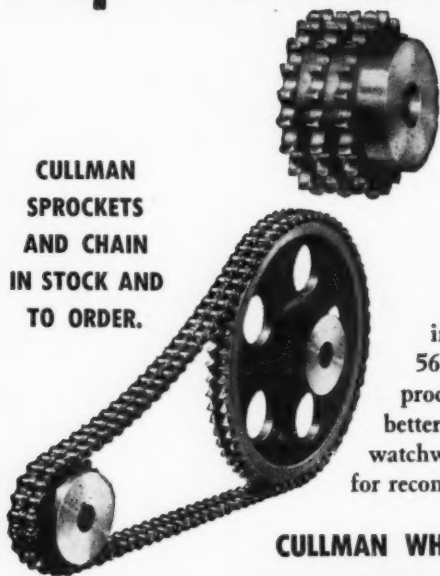


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